# CBSE EXAMINATION PAPER-2025

## NEET-ZOOLOGY

### (Solved)

Time allowed : 3 hours | Maximum Marks : 718

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**General Instructions :**

Read the following instructions carefully and follow them :

i. This question paper contains **180 questions.** All questions are **compulsory.**

ii. This question paper is divided into **1 sections.**

iii. **Section A** – questions number **1 to 180** are multiple choice questions

iv. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

v. Use of calculator is NOT allowed.

## Section A

**Question 1.**

Match List-I with List-II

Choose the option with all correct matches:

[4 Marks]

| List-I | List-II |
|---|---|
| (a) Adenosine | (i) Nitrogen base |
| (b) Adenylic acid | (ii) Nucleotide |
| (c) Adenine | (iii) Nucleoside |
| (d) Alanine | (iv) Amino acid |

(A) A-III, B-IV, C-II, D-I

(B) A-II, B-III, C-I, D-IV

(C) A-III, B-II, C-I, D-IV

(D) A-III, B-II, C-IV ,D-I,

**Question 2.**

All living members of the class Cyclostomata are:

[4 Marks]

(A) Endoparasite

(B) Ectoparasite

(C) Symbiotic

(D) Free living

**Question 3.**

Assertion (A): The primary function of the Golgi apparatus is to package the materials made by the endoplasmic reticulum and deliver it to intracellular targets and outside the cell.

Reason (R): Vesicles containing materials made by the endoplasmic reticulum fuse with the cis face of the Golgi apparatus, and they are modified and released from the trans face of the Golgi apparatus.

In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) A is true but R is false

(B) Both A and R are true and R is the correct explanation of A

(C) Both A and R are true but R is not the correct explanation of A

(D) A is false but R is true

**Question 4.**

Match List-I with List-II. List-I List-II

choose the option with all correct matches.

[4 Marks]

| List-I | | List-II | |
|---|---|---|---|
| A. | Scutellum | I. | Persistent nucellus |
| B. | Non-albuminous seed | II. | Cotyledon of Monocot seed |
| C. | Epiblast | III. | Groundnut |
| D. | Perisperm | IV. | Rudimentary cotyledon |

(A) A-II, B-III, C-IV, D-I

(B) A-IV, B-III, C-I, D-II

(C) A-II, B-IV, C-III, D-I

(D) A-IV, B-III, C-II, D-I

**Question 5.**

Assertion (A): All vertebrates are chordates but all chordates are not vertebrate.

Reason (R): The members of subphylum vertebrata possess notochord during the embryonic period, the notochord is replaced by a cartilaginous or bony vertebral column in adults.

In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is not the correct explanation of A

(C) A is false but R is true

(D) A is true but R is false

**Question 6.**

Silencing of specific mRNA is possible via RNAi because of -

[4 Marks]

(A) Non-complementary ssRNA

(B) Inhibitory ssRNA

(C) Complementary tRNA

(D) Complementary dsRNA

**Question 7.**

Genes R and Y follow Independent assortment. If RRYY produce round yellow seeds and rryy produce wrinkled green seeds, what will be the phenotypic ratio of the $F_2$ generation?

[4 Marks]

(A) Phenotypic ratio-9 : 3 : 3 : 1

(B) Phenotypic ratio-1 : 2 : 1

(C) Phenotypic ratio-9 : 7

(D) Phenotypic ratio-3 : 1

**Question 8.**

Histones are enriched with

[4 Marks]

(A) Phenylalanine & Arginine

(B) Leucine & Lysine

(C) Phenylalanine & Leucine

(D) Lysine & Arginine

**Question 9.**

The first menstruation is called:

[4 Marks]

(A) Menarche

(B) Ovulation

(C) Diapause

(D) Menopause

**Question 10.**

Match List I with List - II.

Choose the correct answer from the options given below:

[4 Marks]

| List-I | | List-II | |
|---|---|---|---|
| A. | Heart | I. | Erythropoietin |
| B. | Kidney | II. | Aldosterone |
| C. | Gastro-intestinal tract | III. | Atrial natriuretic factor |
| D. | Adrenal Cortex | IV. | Secretin |

(A) A-II, B-I, C-III, D-IV

(B) A IV, B-III, C-II, D-I

(C) A I, B-III, C-IV, D-II

(D) A-III, B-I, C-IV, D-II

**Question 11.**

The protein portion of an enzyme is called:

[4 Marks]

(A) Prosthetic group

(B) Coenzyme

(C) Apoenzyme

(D) Cofactor

**Question 12.**

Which of the following is the unit of productivity of an ecosystem?

[4 Marks]

(A) $gm^{-2}$

(B) KCal $m^{-2}$

(C) KCal $m^{-3}$

(D) (KCal $m^{-2}$) $yr^{-1}$

**Question 13.**

Sweet potato and potato represent a certain type of evolution. Select the correct combination of terms to explain the evolution.

[4 Marks]

(A) Analogy, divergent

(B) Homology, convergent

(C) Analogy, convergent

(D) Homology, divergent

**Question 14.**

Assertion (A): Cells of the tapetum possess dense cytoplasm and generally have more than one nucleus. Reason (R): Presence of more than one nucleus in the tapetum increase the efficiency of nourishing the developing microspore mother cells.

In light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both A and R are true and R is NOT the correct explanation of A

(B) A is false but R is true.

(C) A is true but R is false.

(D) Both A and R are true and R is the correct explanation of A.

**Question 15.**

How many meiotic and mitotic divisions need to occur for the development of a mature female gametophyte from the megaspore mother cell in an angiosperm plant?

[4 Marks]

(A) 1 Meiosis and 2 Mitosis

(B) No Meiosis and 3 Mitosis

(C) 1 Meiosis and 3 Mitosis

(D) 2 Meiosis and 3 Mitosis

**Question 16.**

Which of the following is an example of a zygomorphic flower?

[4 Marks]

(A) Chilli

(B) Datura

(C) Pea

(D) Petunia.

**Question 17.**

After maturation, in primary lymphoid organs, the lymphocytes migrate for interaction with antigens to secondary lymphoid organ(s)/ tissue(s) like:

A. thymus

B. bone marrow

C. spleen

D. lymph nodes

E. Peyer’s patches

Choose the correct answer from the options given below:

[4 Marks]

(A) C, D, E only

(B) A, B, C only

(C) B, C, D only

(D) E, A, B only

**Question 18.**

Statement-I: Fig fruit is a non-vegetarian fruit as it has enclosed fig wasps in it.

Statement-II: Fig wasp and fig tree exhibit mutual relationship as fig wasp completes its life cycle in fig fruit and fig fruit gets pollinated by fig wasp.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Statement I is incorrect but statement II is correct

(B) Both statement I and statement II are incorrect

(C) Both statement I and statement II are correct

(D) Statement I is correct but statement II is incorrect.

**Question 19.**

What is the main function of the spindle fibers during mitosis?

[4 Marks]

(A) To provide energy for cell division (partially visible in image)

(B) To repair damaged DNA

(C) To separate the chromosomes

(D) To synthesize new DNA

**Question 20.**

Which one of the following is the characteristic feature of gymnosperms?

[4 Marks]

(A) Gymnosperms have flowers for reproduction

(B) Seeds are naked.

(C) Seeds are absent.

(D) Seeds are enclosed in fruits.

**Question 21.**

Consider the following statements regarding function of adrenal medullary hormones:

A. It causes pupillary constriction

B. It is a hyperglycemic hormone

C. It causes piloerection

D. It increases strength of heart contraction

Choose the correct answer from the options given below:

[4 Marks]

(A) B, C and D only

(B) D only

(C) C and D only

(D) A, C and D only

**Question 22.**

Why can’t insulin be given orally to diabetic patients?

[4 Marks]

(A) It will be digested in Gastro-Intestinal (GI) tract

(B) Because of structural variation

(C) Human body will elicit strong immune response

(D) Its bioavailability will be increased

**Question 23.**

Match List-I with List-II

Choose the option with all correct matches:

[4 Marks]

| List-I | | List-II | |
|---|---|---|---|
| A. | Pteridophyte | I. | *Salvia* |
| B. | Bryophyte | II. | Ginkgo |
| C. | Angiosperm | III. | *Polytrichum* |
| D. | Gymnosperm | IV. | *Selaginella* |

(A) A-IV, B-III, C-II, D-I

(B) A-IV, B-III, C-I, D-II

(C) A-III, B-IV, C-I, D-II

(D) A-III, B-IV, C-II, D-I

**Question 24.**

Who proposed that the genetic code for amino acids should be made up of three nucleotides?

[4 Marks]

(A) Francis Crick

(B) George Gamow

(C) Franklin Stahl

(D) Jacque Monod

**Question 25.**

Match List-I with List-II:

Choose the option with all correct matches:

[4 Marks]

| List-I | | List-II | |
|---|---|---|---|
| A. | The Evil Quartet | I. | Cryopreservation |
| B. | Ex situ conservation | II. | Alien species invasion |
| C. | *Lantana camara* | III. | Causes of biodiversity losses |
| D. | Dodo | IV. | Extinction |

(A) A-III, B-II, C-IV, D-I

(B) A-III, B-I, C-II, D-IV

(C) A-III, B-IV, C-II, D-I

(D) A-III, B-II, C-I, D-IV

**Question 26.**

Which of the following hormones released from the pituitary is actually synthesized in the hypothalamus?

[4 Marks]

(A) Anti-diuretic hormone (ADH)

(B) Adenocorticotrophic hormone (ACTH)

(C) Follicle-stimulating hormone (FSH)

(D) Luteinizing hormone (LH)

**Question 27.**

Role of the water vascular system in Echinoderms is:

A. Respiration and Locomotion

B. Excretion and Locomotion

C. Capture and transport of food

D. Digestion and Respiration

E. Digestion and Excretion

Choose the correct answer from the options given below:

[4 Marks]

(A) A and B only

(B) B and C only

(C) A and C only

(D) B, D and E only

**Question 28.**

Which of the following type of immunity is present at the time of birth and is a non-specific type of defence in the human body?

[4 Marks]

(A) Humoral Immunity

(B) Innate Immunity

(C) Cell-mediated Immunity

(D) Acquired Immunity

**Question 29.**

In bryophytes, the gemmae help in which one of the following?

[4 Marks]

(A) Gaseous exchange

(B) Asexual reproduction

(C) Sexual reproduction

(D) Nutrient absorption

**Question 30.**

In frog, the renal portal system is a special venous connection that acts to link:

[4 Marks]

(A) Liver and kidney

(B) Kidney and lower part of body

(C) Kidney and intestine

(D) Liver and intestine

**Question 31.**

Statement-I: In ecosystem, there is unidirectional flow of energy of sun from producers to consumers.

Statement-II: Ecosystems are exempted from 2$^{nd}$nd law of thermodynamics.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both statement-I and statement II are correct

(B) Statement-I is correct but statement II is incorrect

(C) Both statement-I and statement II are incorrect

(D) Statement-I is incorrect but statement II is correct

**Question 32.**

Which of the following statements about RuBisCO is true?

[4 Marks]

(A) It is involved in the photolysis of water.

(B) It binds oxygen than carbon dioxide.

(C) It is active in the dark.

(D) It catalyzes the carboxylation of RuBP.

**Question 33.**

Which of the following enzyme(s) are **NOT** essential for gene cloning?

A. Restriction enzymes

B. DNA ligase

C. DNA mutase

D. DNA recombinase

E. DNA polymerase

Choose the correct answer from the options given below:

[4 Marks]

(A) B and C only

(B) A and B only

(C) C and D only

(D) D and E only

**Question 34.**

Which factor is important for termination of transcription?

[2 Marks]

(A) γ (gamma)

(B) σ (sigma)

(C) α (alpha)

(D) ρ (rho)

**Question 35.**

Frogs respire in water by skin and buccal cavity and on land by skin, buccal cavity and lungs. Choose the correct answer from the following:

[4 Marks]

(A) The statement is false for both the environment

(B) The statement is true for both the environment

(C) The statement is true for water but false for land

(D) The statement is false for water but true for land

**Question 36.**

Twins are born to a family that lives next door to you. The twins are a boy and a girl. Which of the following must be true?

[4 Marks]

(A) They are fraternal twins.

(B) They have 75% identical genetic content.

(C) They were conceived through in vitro fertilization.

(D) They are monozygotic twins.

**Question 37.**

Which of the following microbes is NOT involved in the preparation of household products?

A. Aspergillus niger

B. Lactobacillus

C. Trichoderma polysporum

D. Saccharomyces cerevisiae

E, Propionibacterium sharmanii

[4 Marks]

(A) A and C only

(B) C and E only

(C) Cand D only

(D) A and B only

**Question 38.**

Match List-I with List-II.

Choose the correct answer from the options given below:

[4 Marks]

| List-I | | List-II | |
|---|---|---|---|
| A. | Progesterone | I. | Pars intermedia |
| B. | Relaxin | II. | Ovary |
| C. | Melanocyte stimulating hormone | III. | Adrenal Medulla |
| D. | Catecholamines | IV. | Corpus luteum |

(A) A-IV, B-II, C-III, D-I

(B) A-IV, B-II, C-I, D-III

(C) A-III, B-II, C-IV, D-I

(D) A-II, B-IV, C-I, D-III

**Question 39.**

The blue and white selectable markers have been developed which differentiate recombinant colonies from non-recombinant colonies on the basis of their ability to produce colour in the presence of a chromogenic substrate.

Given below are two statements about this method:

Statement-I: The blue coloured colonies have DNA insert in the plasmid and they are identified as recombinant colonies.

Statement-II: The colonies without blue colour have DNA insert in the plasmid and are identified as recombinant colonies.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Statement I is incorrect but statement II is correct

(B) Statement I is correct but statement II is incorrect

(C) Both statement I and statement II are incorrect

(D) Both statement I and statement II are correct

**Question 40.**

The complex II of mitochondrial electron transport chain is also known as

[4 Marks]

(A) Cytochrome c oxidase

(B) Cytochrome $bc_1$

(C) Succinate dehydrogenase

(D) NADH dehydrogenase

**Question 41.**

Polymerase chain reaction (PCR) amplifies DNA following the equation

[4 Marks]

(A) $2N^2$

(B) $2n + 1$

(C) $2^n$

(D) $N^2$

**Question 42.**

What are the potential drawbacks in adoption of the IVF method?

A. High fatality risk to mother

B. Expensive instruments and reagents

C. Husband / wife necessary for being donors

D. Less adoption of orphans

E. Not available in India

F. Possibility that the early embryo does not survive

Choose the correct answer from the options given below:

[4 Marks]

(A) A, C, D, F only

(B) A, B, C, E, F only

(C) A, B, C, D only

(D) B, D, F only

**Question 43.**

What is the name of the blood vessel that carries deoxygenated blood from the body to the heart in a frog?

[4 Marks]

(A) Vena cava

(B) Pulmonary vein

(C) Aorta

(D) Pulmonary artery

**Question 44.**

Which one of the following statements refers to Reductionist Biology?

[4 Marks]

(A) Behavioural approach to study and understand living organisms.

(B) Physiological approach to study and understand living organisms.

(C) Chemical approach to study and understand living organisms.

(D) Physico-chemical approach to study and understand living organisms

**Question 45.**

Statement-I: In the RNA world, RNA is considered the first genetic material evolved to carry out essential life processes. RNA acts as a genetic material and also as a catalyst for some important biochemical reactions in living systems. Being reactive, RNA is unstable.

Statement-II: DNA evolved from RNA and is a more stable genetic material. Its double helical strands being complementary, resist changes by evolving repairing mechanism.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Statement I is correct but statement II is correct.

(B) Statement I is correct but statement II is incorrect.

(C) Both statement I and statement II are incorrect

(D) Both statement I and statement II are correct.

**Question 46.**

Match List-I with List-II.

Choose the correct answer from the options given below

[4 Marks]

| List-I | List-II |
|---|---|
| (a) Emphysema | (i) Rapid spasms in muscle due to low $Ca^{++}$ in body fluid |
| (b) Angina Pectoris | (ii) Damaged alveolar walls and decreased respiratory surface |
| (c) Glomerulonephritis | (iii) Acute chest pain when not enough oxygen is reaching to heart muscle |
| (d) Tetany | (iv) Inflammation of glomeruli of kidney |

(A) A-II, B-III, C-IV, D-I

(B) A-III, B-I, C-II, D-IV

(C) A-III, B-I, C-IV, D-II

(D) A-II, B-IV, C-III, D-I

**Question 47.**

Which of the following is an example of non-distilled alcoholic beverage produced by yeast?

[4 Marks]

(A) Brandy

(B) Rum

(C) Beer

(D) Whisky

**Question 48.**

Given below are two statements:

Statement-I: In a floral formula ⊕ stands for zygomorphic nature of the flower, and ( G with under line )

stands for inferior ovary.

Statement-II: In a floral Formula ⊕ stands for actinomorphic nature of the flower and ( G with under line ) stands for superior ovary.

In the light of the above statements,

choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is incorrect but statement II is correct

(B) Both statement I and statement II are incorrect.

(C) Statement I is correct but statement II is incorrect.

(D) Both statement I and statement II are correct.

**Question 49.**

Streptokinase produced by bacterium Streptococcus is used for

[4 Marks]

(A) Ethanol production

(B) Liver disease treatment

(C) Removing clots from blood vessels

(D) Curd production

**Question 50.**

Which chromosome in the human genome has the highest number of genes?

[4 Marks]

(A) Chromosome 10

(B) Chromosome 1

(C) Chromosome Y

(D) Chromosome X

**Question 51.**

Which of the following statement is correct about location of the male frog copulatory pad?

[4 Marks]

(A) First digit of hind limb

(B) First digit of the fore limb

(C) Second digit of fore limb

(D) First and second digit of fore limb

**Question 52.**

Which one of the following phytohormones promotes nutrient mobilization which help in the delay of leaf senescence in plants?

[4 Marks]

(A) Cytokinin

(B) Abscisic acid

(C) Gibberellin

(D) Ethylene

**Question 53.**

While trying to find out the characteristic of a newly found animal, a researcher did the histology of adult animal and observed a cavity with presence of mesodermal tissue towards the body wall but no mesodermal tissue was observed towards the alimentary canal. What could be the possible coelom of that animal?

[4 Marks]

(A) Spongocoelomate

(B) Pseudocoelomate

(C) Schizocoelomate

(D) Acoelomate

**Question 54.**

Match List-I with List-II.

Choose the correct answer from the options given below:

[4 Marks]

| List-I | List-II |
|---|---|
| (a) Head | (i) Enzymes |
| (b) Middle piece | (ii) Sperm motility |
| (c) Acrosome | (iii) Energy |
| (d) Tail | (iv) Genetic material |

(A) A-III, B-II, C-I, D-IV

(B) A-IV, B-III, C-I, D-II

(C) A-IV, B-III, C-II, D-I

(D) A-III, B-IV, C-II, D-I

**Question 55.**

Given below are the stages in the life cycle of pteridophytes. Arrange the following stages in the correct sequence.

A. Prothallus stage

B. Meiosis in spore mother cells

C. Fertilisation

D. Formation of archegonia and antheridia in gametophyte

E. Transfer of antherozoids to the archegonia in presence of water

Choose the correct answer from the options given below:

[4 Marks]

(A) B, A, E, C, D

(B) E, D, C, B, A

(C) D, E, C, A, B

(D) B, A, D, E, C

**Question 56.**

Cardiac activities of the heart are regulated by:

A. Nodal tissue

B. A special neural centre in the medulla oblongata

C. Adrenal medullary hormones

D. Adrenal cortical hormones

Choose the correct answer from the options given below:

[4 Marks]

(A) A, B, C and D

(B) A, B and D only

(C) A, B and C only

(D) A, C and D only

**Question 57.**

Which of following organisms cannot fix nitrogen?

A. *Azotobacter*
B. *Oscillatoria*
C. *Anabaena*
D. *Volvox*

[4 Marks]

(A) E only

(B) D only

(C) B only

(D) A only

**Question 58.**

Statement-I: Transfer RNAs and ribosomal RNA do not interact with mRNA.

Statement-II: RNA interference (RNAi) takes place in all eukaryotic organisms as a method of cellular defence.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both statement I and statement II are incorrect

(B) Both statement I and statement II are correct

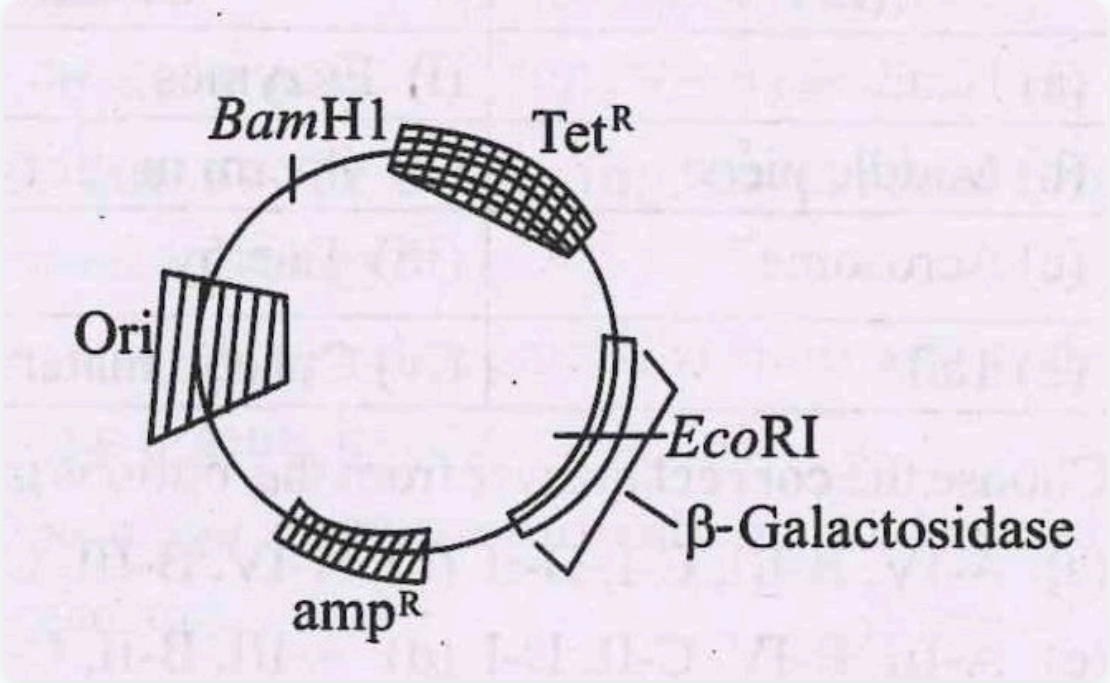
(C) Statement I is incorrect but statement II is correct

(D) Statement I is correct but statement II is incorrect

**Question 59.**

In the above represented plasmid an alien piece of DNA is inserted at EcoRI site. Which of the following strategies will be chosen to select the recombinant colonies?

[4 Marks]




(A) White colour colonies will be selected

(B) Blue colour colonies grown on ampicillin plates can be selected

(C) Blue colour colonies will be selected

(D) Using ampicillin & tetracyclin containing medium plate

**Question 60.**

Which of the following genetically engineered organisms was used by Eli Lilly to prepare human insulin?

[4 Marks]

(A) Phage

(B) Yeast

(C) Virus

(D) Bacterium

**Question 61.**

Name the class of enzyme that usually catalyze the following reaction:

S–G + S^# → S + S^# –G

Where,

G → a group other than hydrogen

S → a substrate

S^# → another substrate

[4 Marks]

(A) Hydrolase

(B) Transferase

(C) Lyase

(D) Ligase

**Question 62.**

Find the statement that is NOT correct with regard to the structure of monocot stem.

[4 Marks]

(A) Phloem parenchyma is absent.

(B) Vascular bundles are scattered.

(C) Vascular bundles are conjoint and closed.

(D) Hypodermis is parenchymatous

**Question 63.**

The correct sequence of events in the life cycle of bryophytes is

A. Fusion of antherozoid with egg.

B. Attachment of gametophyte to substratum.

C. Reduction division to produce haploid spores.

D. Formation of sporophyte.

E. Release of antherozoids into water.

Choose the correct answer from the options given below:

[4 Marks]

(A) B, E, A, D, C

(B) D, E, A, B, C

(C) D, E, A, C, B

(D) B, E, A, C, D

**Question 64.**

Which are correct?

A. Computed tomography and magnetic resonance imaging detect cancers of internal organs.

B. Chemotherapeutics drugs are used to kill non-cancerous cells.

C. α-interferon activate the cancer patient's immune system and helps in destroying the tumour.

D. Chemotherapeutic drugs are biological response modifiers.

E. In the case of leukaemia blood cell counts are decreased.

Choose the correct answer from the options given below:

[4 Marks]

(A) C and D only

(B) B and D only

(C) D and E only

(D) A and C only

**Question 65.**

Match List-I with List-II.

Choose the correct answer from the options given below:

[4 Marks]

| List-I | List-II |
|---|---|
| (a) Centrosome | (i) Mitochondrion |
| (b) Cilium | (ii) Cell division |
| (c) Cristae | (iii) Cell movement |
| (d) Cell membrane | (iv) Phospholipid Bilayer |

(A) A-II, B-I, C-IV, D-III

(B) A-IV, B-II, C-III, D-I

(C) A-I B-II, C-III, D-IV

(D) A-II, B-III, C-I, D-IV

**Question 66.**

Match List-I with List-II.

Choose the option from with all correct matches.

[4 Marks]

| List-I | List-II |
|---|---|
| (a) Chlorophyll-*a* | (i) Yellow- green |
| (b) Chlorophyll-*b* | (ii) Yellow |
| (c) Xanthophylls | (iii) Blue- green |
| (d) Carotenoids | (iv) Yellow to Yellow-orange |

(A) A-III, B-IV, C-II, D-I

(B) A-I, B-II, C-IV, D-III

(C) A-III, B-I, C-II, D-IV

(D) A-I, B-IV, C-III, D-II

**Question 67.**

Find the correct statements:

A. In human pregnancy, the major organ systems are formed at the end of 12 weeks.

B. In human pregnancy the major organ systems are formed at the end of 8 weeks.

C. In human pregnancy heart is formed after one month of gestation.

D. In human pregnancy, limbs and digits develop by the end of second month.

E. In human pregnancy the appearance of hair is usually observed in the fifth month.

Choose the correct answer from the options given below:

[4 Marks]

(A) A and E only

(B) B, C, D and E only

(C) B and C only

(D) A, C, D and E only

**Question 68.**

In the seeds of cereals, the outer covering of endosperm separates the embryo by a protein-rich layer called:

[4 Marks]

(A) Coleoptile

(B) Integument

(C) Aleurone Layer

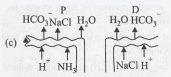
(D) Coleorhiza

**Question 69.**

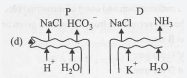
Which of the following diagrams is correct with regard to the proximal (P) and distal (D) tubule of the Nephron.

[4 Marks]

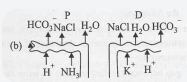
(A)



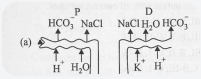

(B)




(C)



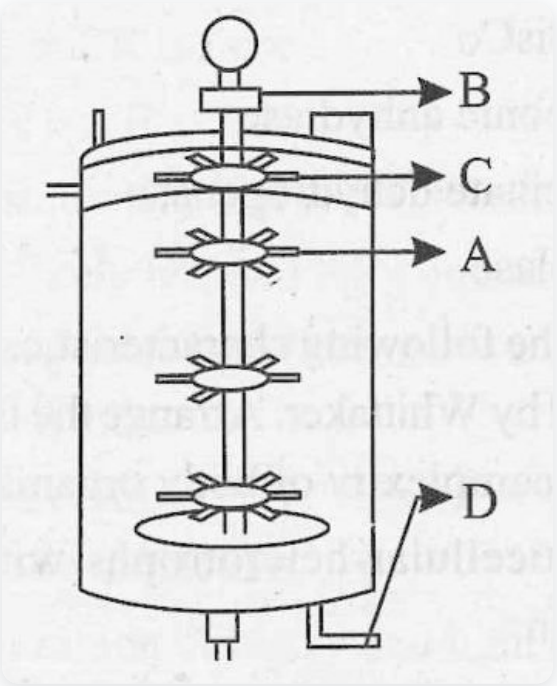
(D)




**Question 70.**

Identify the part of a bio-reactor which is used as a foam breaker from the given figure.

[4 Marks]




(A) B

(B) D

(C) A

(D) C

**Question 71.**

Assertion (A): A typical unfertilised, angiosperm embryo sac at maturity is 8 nucleated and 7-celled. Reason (R): The egg apparatus has 2 polar nuclei. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) both A and R are true but R is NOT the correct explanation of A.

(B) A is false but R is true.

(C) A is true but R is false.

(D) Both A and R are true and R is the correct explanation of A.

**Question 72.**

A specialised membranous structure in a prokaryotic cell which helps in cell wall formation, DNA replication and respiration is:

[4 Marks]

(A) Chromatophores

(B) Endoplasmic Reticulum

(C) Mesosome

(D) Cristae

**Question 73.**

Which of the following are the post-transcriptional events in an eukaryotic cell?

A. Transport of pre-mRNA to cytoplasm prior to splicing.

B. Removal of introns and joining of exons.

C. Addition of methyl group 5′ end of hnRNA.

D. Addition of adenine residues at 3′ end of hnRNA.

E. Base pairing of two complementary RNAs.

Choose the correct answer from the options given below:

[4 Marks]

(A) B, C, E only

(B) B, C, D only

(C) C, D, E only

(D) A, B, C only

**Question 74.**

What is the pattern of inheritance for polygenic trait?

[4 Marks]

(A) X-linked recessive inheritance pattern

(B) Non-mendelian inheritance pattern

(C) Mendelian inheritance pattern

(D) Autosomal dominant pattern

**Question 75.**

Which one of the following enzymes contains ‘Haem’ as the prosthetic group?

[4 Marks]

(A) Carbonic anhydrase

(B) Catalase

(C) RuBisCo

(D) Succinate dehydrogenase

**Question 76.**

Each of the following characteristics represent a Kingdom proposed by Whittaker. Arrange the following in increasing order of complexity of body organization.

A. Multicellular heterotrophs with cell wall made of chitin.

B. Heterotrophs with tissue/organ/organ system level of body organization.

C. Prokaryotes with cell wall made of polysaccharides and amino acids.

D. Eukaryotic autotrophs with tissue/organ level of body organization.

E. Eukaryotes with cellular body organization.

Choose the correct answer from the options given below:

[4 Marks]

(A) C, E, A, B, D

(B) C, E, A, D, B

(C) A, C, E, D, B

(D) A, C, E, B, D

**Question 77.**

Who is known as the father of Ecology in India?

[4 Marks]

(A) Ramdeo Misra

(B) Birbal Sahni

(C) Ram Udar

(D) S.R. Kashyap

**Question 78.**

Match List-I with List-II.

Choose the correct answer from the options given below:

[4 Marks]

| List-I | List-II |
|---|---|
| (a) Alfred Hershey and Martha Chase | (i) *Streptococcus pneumoniae* |
| (b) Euchromatin | (ii) Densely packed and dark-stained |
| (c) Frederick Griffith | (iii) Loosely packed and light-stained |
| (d) Heterochromatin | (iv) DNA as genetic material confirmation |

(A) A-IV, B-II, C-I, D-III

(B) A-IV, B-III, C-I, D-II

(C) A-II, B-IV, C-I, D-III

(D) A-III, B-II, C-IV, D-I

**Question 79.**

Neoplastic characteristics of cells refer to:

A. A mass of proliferating cell

B. Rapid growth of cells

C. Invasion and damage to the surrounding tissue

D. Those confined to original location

Choose the correct answer from the options given below:

[4 Marks]

(A) A, B, D only

(B) A, B only

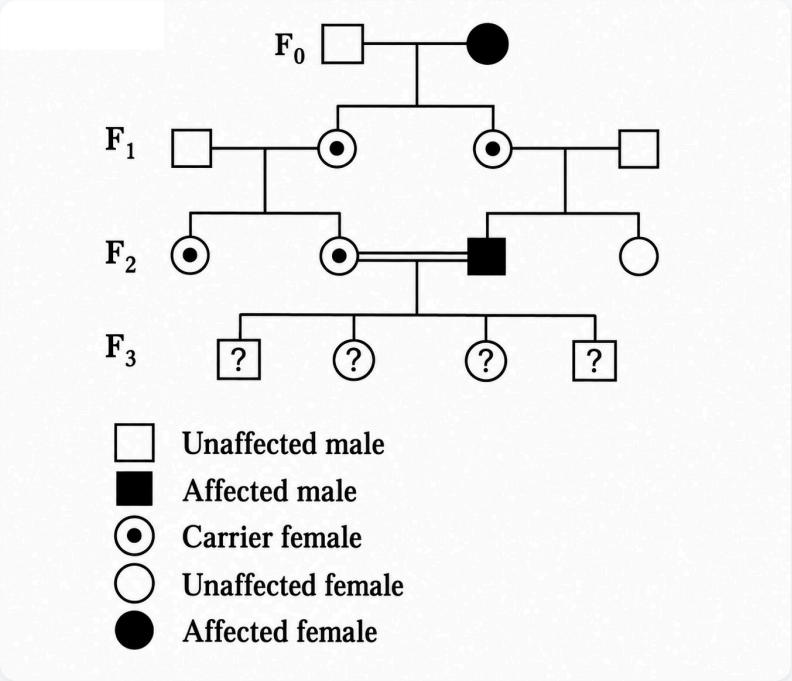
(C) B, C, D only

(D) A, B, C only

**Question 80.**

With the help of given pedigree, find out the probability for the birth of a child having no disease and being a carrier (has the disease mutation in one allele of the gene) in $F_3$ generation

[4 Marks]




(A) zero

(B) 1/2

(C) 1/2

(D) 1/4

**Question 81.**

Statement-I: The primary source of energy in an ecosystem is solar energy.

Statement-II: The rate of production of organic matter during photosynthesis in an ecosystem is called net primary productivity (NPP).

In the light of the above statements, choose the. most appropriate answer form the options given below:

[4 Marks]

(A) Statement I is correct but statement II is correct.

(B) Both statement I and statement II are correct.

(C) Statement I is correct but statement II is incorrect.

(D) Both statement I and statement I are incorrect.

**Question 82.**

Given below are two

Statement I: The DNA fragments extracted from gel electrophoresis can be used in construction of recombinant DNA.

Statement II: Smaller size DNA fragments are observed near anode while larger fragments are found near the wells in An agarose gel.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Statement I is incorrect but statement I is correct

(B) Statement I is correct but statement II is incorrect

(C) Both statement I and statement II are incorrect

(D) Both statement I and statement II are correct

**Question 83.**

Read the following statements on plant growth and development.

A. Parthenocarpy can be induced by auxins.

B. Plant growth regulators can be involved in promotion as well as inhibition of growth.

C. Dedifferentiation is a pre-requisite for re-differentiation.

D. Abscisic acid is a plant growth promoter.

E. Apical dominance promotes the growth of lateral buds.

Choose the option with all correct statements.

[4 Marks]

(A) A, D, E only

(B) B, D, E only

(C) A, B, E only

(D) A, B, C only

**Question 84.**

Consider the following:

A. The reductive division for the human female gametogenesis starts earlier than that of the male gametogenesis.

B. The gap between the first meiotic division and the second meiotic division is much shorter for males compared to females.

C. The first polar body is associated with the formation of the primary oocyte.

D. Luteinizing Hormone (LH) surge leads to disintegration of the endometrium and onset of menstrual bleeding.

Choose the correct answer from the options given below:

[4 Marks]

(A) A and C are true

(B) B and C are true

(C) B and D are true

(D) A and B are true

**Question 85.**

Identify the statement that is NOT correct.

[4 Marks]

(A) Constant region of heavy and light chains are located at C-terminus of antibody molecules.

(B) Antigen binding site is located at C-terminal region of antibody molecules.

(C) The heavy and light chains are held together by disulfide bonds.

(D) Each antibody has two light and two heavy chains.

**Question 86.** Assertion(A): Both wind and water pollinated flowers are not very colourful and do not produce nectar. Reason (R): The flowers produce enormous amount of pollen grains in wind and water pollinated flowers. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both A and R are true and R is NOT the correct explanation of A.

(B) Both A and R are true and R is the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

**Question 87.** Epiphytes that are growing on a mango branch is an example of which of the following?

[4 Marks]

(A) Commensalism

(B) Predation

(C) Mutualism

(D) Amensalism

**Question 88.**

From the statements given below choose the correct option:

A. The eukaryotic ribosomes are 80S and prokaryotic ribosomes are70S

B. Each ribosome has two sub-units.

C. The two sub-units of 80S ribosome are 60S and 40S while that of 70S are 50S and 30S.

D. The two sub-units of 80S ribosome are 60S and 20S and that of 70S are 50S and 20S.

E. The two sub-units of 80S ribosome are 60S and 30S and that of 70S are 50S and 30S

[4 Marks]

(A) A, B, D, are true

(B) B, D, E are true

(C) A,B,E are true

(D) A B, C are true

**Question 89.** Which one of following is an example of ex-situ conservation?

[4 Marks]

(A) National park

(B) Wildlife Sanctuary

(C) Zoos and botanical gardens

(D) Protected areas

**Question 90.**

The ratio of the wavelengths of the light absorbed by a Hydrogen atom when it undergoes $n=2 \rightarrow n=3$ and $n=4 \rightarrow n=6$ transitions, respectively, is

[4 Marks]

(A) 1/36

(B) 1/16

(C) 1/4

(D) 1/9

**Question 91.**

Which of the following statements are true? A. Unlike Ga that has a very high melting point, Cs has a very low melting point. B. On Pauling scale, the electronegativity values of N and Cl are not the same. C. Ar, $K^+$, $Cl^-$, $Ca^{2+}$ and $S^{2-}$ are all isoelectronic species. D. The correct order of the first ionization enthalpies of Na, Mg, Al, and Si is Si > Al > Mg > Na. E. The atomic radius of Cs is greater than that of Li and Rb. Choose the correct answer from the options given below:

[4 Marks]

(A) C and D only

(B) A, C and E only

(C) C and E only

(D) A, B and E only

**Question 92.**

Match List-I with List-II. Choose the correct answer from the option given below:

[4 Marks]

| List-I (Ion) | | List-II (Group Number in Cobalt Analysis) | |
|---|---|---|---|
| A. | $Co^{2+}$ | I. | Group-I |
| B. | $Mg^{2+}$ | II. | Group-III |
| C. | $Fe^{3+}$ | III. | Group-IV |
| D. | $Al^{3+}$ | IV. | Group-VI |

(A) A-III, B-IV, C-II, D-I

(B) A-III, B-IV, C-I, D-II

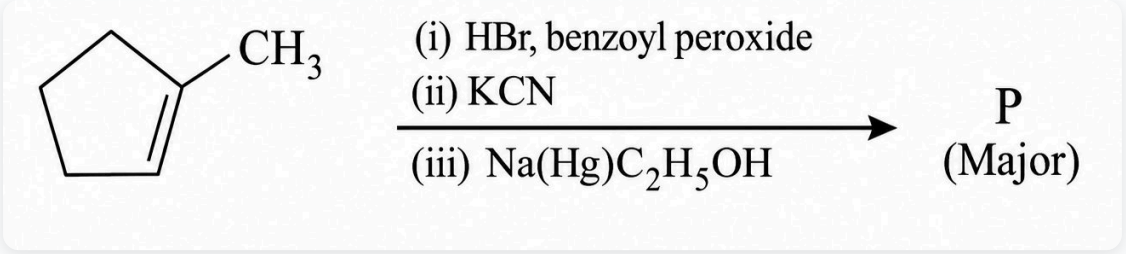
(C) A-III, B-II, C-IV, D-I

(D) A-III, B-II, C-I, D-IV

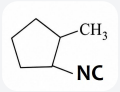
**Question 93.**

Predict the major product ‘P’ in the following sequence of reactions -

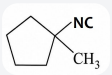
[4 Marks]



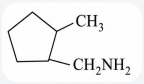

(A)



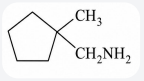

(B)




(C)




(D)




**Question 94.**

Energy and radius of first Bohr orbit of $He^{2}$ and $Li^{2+}$ are [Given $R_H = 2.18 \times 10^{-18}$ J, $a_0 = 52.9$ pm]

[4 Marks]

(A) $E_n(Li^{2+}) = -8.72 \times 10^{-16}$ J; $r_n(Li^{2+}) = 17.6$ pm $E_n(He^{+}) = -19.62 \times 10^{-16}$ J; $r_n(He^{+}) = 17.6$ pm

(B) $E_n(Li^{2-}) = -19.62 \times 10^{-16}$ J; $r_n(Li^{2+}) = 17.6$ pm $E_n(He^{+}) = -8.72 \times 10^{-16}$ J; $r_n(He^{+}) = 26.4$ pm

(C) $E_n(Li^{2+}) = -19.62 \times 10^{-18}$ J; $r_n(Li^{2+}) = 17.6$ pm $E_{n}(He^{+}) = -8.72 \times 10^{-18}$ J; $r_n(He^{+}) = 26.4$ pm

(D) $E_n(Li^{2+}) = -8.72 \times 10^{-18}$ J; $r_n(Li^{2+}) = 26.4$ pm $E_n(He^{+}) = -19.62 \times 10^{-18}$ J; $r_n(He^{+}) = 17.6$ pm

**Question 95.**

Which of the following are paramagnetic?

A. $[NiCl_4]^{2-}$

B. $Ni(CO)_4$

C. $[Ni(CN)_4]^{2-}$

D. $[Ni(H_2O)_6]^{2+}$

E. $Ni(PPh_3)_4$

Choose the correct answer from the options given below:

[4 Marks]

(A) A, D and E only

(B) B and E only

(C) A and C only

(D) A and D only

**Question 96.**

Given below are two statements :

Statement-I: Like nitrogen that can form antmonia, arsenic can form arsine,

Statement-II : Antimony cannot form antimony pentoxide.

In the light of the above statements, choose the most appropriate answer from the options given below :

[4 Marks]

(A) Both Statement I and Statement II are incorrect

(B) Both Statement I and Statement II are correct

(C) Statement I is incorrect but Statement II is correct.

(D) Statement I is correct but Statement II is incorrect

**Question 97.**

Which among the following electronic configurations belong to main group elements? A. $[Ne]\ 3s^1$ B. $[Ar]\ 3d^3 4s^2$ C. $[Kr]\ 4d^{10} 5s^2 5p^5$ D. $[Ar]\ 3d^{10} 4s^1$ E. $[Rn]\ 5f^0 6d^2 7s^2$ Choose the correct answer from the option given below:

[4 Marks]

(A) D and E only

(B) A, C and D only

(C) A and C only

(D) B and E only

**Question 98.** Dalton's Atomic theory could not explain which of the following?

[4 Marks]

(A) Law of conservation of mas

(B) Law of constant proportion

(C) Law of multiple proportion

(D) Law of gaseous volume

**Question 99.**

Consider the following compounds: $KO_2$, $H_2O_2$ and $H_2SO_4$. The oxidation states of the underlined elements in them are, respectively,

[4 Marks]

(A) +4, –4, and +6

(B) +1, –2, and +4

(C) +1, –1, and +6

(D) +2, –2, and +6

**Question 100.** If the half-life ($t_1/_2$) for a first order reaction is 1 minute, then the time required for 99.9% completion of the reaction is closest to:

[4 Marks]

(A) 2 minutes

(B) 4 minutes

(C) 5 minutes

(D) 10 minutes

**Question 101.**

The correct order of the wavelength of light absorbed by the following complexes is, A. $[Co(NH_3)_6]^{3+}$ B. $[Co(CN)_6]^{3-}$ C. $[Cu(H_2O)_4]^{2+}$ D. $[Ti(H_2O)_6]^{3+}$ Choose the correct answer from the options given below:

[4 Marks]

(A) C < A < D < B

(B) B < A < D < C

(C) C < D < A < B

(D) B < D < A < C

**Question 102.**

Which one of the following compounds can exist as cis-trans isomers?

[4 Marks]

(A) 1,2-Dimethylcyclohexane

(B) 1,1-Dimethylcyclopropane

(C) 2-Methylhex-2-ene

(D) Pent-1-ene

**Question 103.**

Phosphoric acid ionizes in three steps with their ionization constant values $K_{a1}$, $K_{a2}$ and $K_{a3}$, respectively, While K is the overall ionization constant. Which of the following statements are true?

A. $\log K = \log K_{a1} + \log K_{a2} + \log K_{a3}$

B. $H_3PO_4$ is a stronger acid than $H_2PO_4^-$ and $HPO_4^{2-}$

C. $K_{a1} > K_{a2} > K_{a3}$ D. $K_{a1} = K_{a3} + K_{a2}/2$

Choose the correct answer from the options given below:

[4 Marks]

(A) A and C only

(B) A and B only

(C) B, C and D only

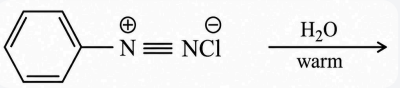
(D) A, B and C only

**Question 104.**

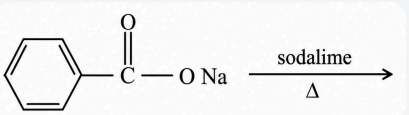
Which one of the following reactions does NOT give benzene as the product?

[4 Marks]

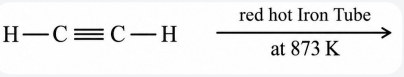
(A)



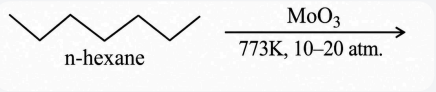

(B)




(C)




(D)




**Question 105.**

If the molar conductivity ($A_m$) of a 0.050 mol $L^{-1}$ solution of a monobasic weak acid is 90 S $cm^2$ $mol^{-1}$, its extent (degree) of dissociation will be [ Assume $\Lambda^0_+$ 349.6 S $cm^2$ $mol^{-1}$ and $\Lambda^0_-$ = 50.4 S $cm^2$ $mol^{-1}$]

[4 Marks]

(A) 0.215

(B) 0.225

(C) 0.125

(D) 0.115

**Question 106.**

Given below are two statements :

Statement-I: A hypothetical diatomic molecule with bond order zero is quite stable.

Statement-II: As bond order increases, the bond length increases.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Statement I is true but Statement II is false

(B) Statement I is false but Statement II is true

(C) Both Statement I and Statement II are false

(D) Both Statement I and Statement II are true

**Question 107.**

Out of the following complex compounds, which of the compound will be having the minimum conductance in solution?

[4 Marks]

(A) $[Co(NH_3)_3Cl_3]$

(B) $[Co(NH_3)_4Cl_2]$

(C) $[Co(NH_3)_6]Cl_3$

(D) $[Co(NH_3)_5Cl]Cl$

**Question 108.** Match List-I with List-II. Choose the correct answer from the options given below:

[4 Marks]

| List-I | List-II |
|---|---|
| A. $XeO_3$ | I. $sp^3d$, linear |
| B. $XeF_2$ | II. $sp^3$, pyramidal |
| C. $XeOF_4$ | III. $sp^3d^2$, distorted octahedral |
| D. $XeF_6$ | IV. $sp^3d^3$, square pyramidal |

(A) A-II, B-I, C-IV, D-III

(B) A-II, B-I, C-III, D-IV

(C) A-IV, B-II, C-I, D-III

(D) A-IV, B-II, C-III, D-I

**Question 109.**

Match List-I with List-II. Choose the correct answer from the options given below

[4 Marks]

Match **List-I** with **List-II**.

| | List-I (Example) | | List-II (Type of Solution) |
|---|---|---|---|
| A. | Humidity | I. | Solid in solid |
| B. | Alloys | II. | Liquid in gas |
| C. | Amalgams | III. | Solid in gas |
| D. | Smoke | IV. | Liquid in solid |

Choose the **correct** answer from the options given below

(A) A-III, B-I, C-IV, D-II

(B) A-III, B-II, C-I, D-IV

(C) A-II, B-IV, C-I, D-III

(D) A-II, B-I, C-IV, D-III

**Question 110.** The correct order of decreasing basic strength of the given amines is:

[4 Marks]

(A) N-methylaniline > benzenamine > ethanamine > N-ethylethanamine

(B) N-ethylethanamine > ethanamine > benzenamine > N-methylaniline

(C) N-ethylethanamine > ethanamine > N-methylaniline > benzenamine

(D) benzenamine > ethanamine > N-methylaniline > N-ethylethanamine

**Question 111.**

Among the following choose the ones with equal number of atoms. A. 212 g of $Na_2CO_3(s)$ [molar mass = 106 g] B. 248 g of $Na_2O(s)$ [molar mass = 62 g] C. 240 g of NaOH(s) [molar mass = 40 g] D. 12 g of $H_2(g)$ [molar mass = 2 g] E. 220 g of $CO_2(g)$ [molar mass = 44 g] Choose the correct answer from the options given below:

[4 Marks]

(A) A, B and D only

(B) B, D and E only

(C) B,C and D only

(D) A, B and C only

**Question 112.** Match List-I with List-II. Choose the correct answer from the options given below:

[4 Marks]

| List-I (Name of the Vitamin) | List-II (Deficiency Disease) |
|---|---|
| A. Vitamin $B_{12}$ | I. Cheilosis |
| B. Vitamin D | II. Convulsions |
| C. Vitamin $B_2$ | III. Rickets |
| D. Vitamin $B_6$ | IV. Pernicious anaemia |

(A) A-I, B-III, C-II, D-IV

(B) A-IV, B-III, C-I, D-II

(C) A-II, B-III, C-I, D-IV

(D) A-IV, B-III, C-II, D-I

**Question 113.**

The correct order of decreasing acidity of the following aliphatic acids is:

[4 Marks]

(A) $CH_3COOH > (CH_3)_2CHCOOH > (CH_3)_2CCOOH > HCOOH$

(B) $(CH_3)_3CCOOH > (CH_3)_2CHCOOH > CH_3COOH > HCOOH$

(C) $HCOOH > CH_3COOH > (CH_3)_3CHCOOH > (CH_3)_3CCOOH$

(D) $HCOOH > (CH_3)_3CCOOH > (CH_3)_2CHCOOH > CH_3COOH$

**Question 114.**

Given below are two statement :

Statement-I: Ferromagnetism is considered as an extreme form of paramagnetism.

Statement-II: The number of unpaired electrons in a $Cr^{2+}$ ion (Z = 24) is the same as that of a $Nd^{3+}$ ion (Z = 60). In the light of the above statements,

choose the correct answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are true

(B) Statement I is false but Statement II is true

(C) Both Statement I and Statement II are false

(D) Statement I is true but Statement II is false

**Question 115.** Match List-I with List-II. Choose the correct answer from the options given below:

[4 Marks]

| | **List-I (Mixture)** | | **List-II (Method of Separation)** |
|---|---|---|---|
| A. | $CHCl_3 + C_6H_5NH_2$ | I. | Distillation under reduced pressure |
| B. | Crude oil in petroleum industry | II. | Steam distillation |
| C. | Glycerol from spent-lye | III. | Fractional distillation |
| D. | Aniline-water | IV. | Simple distillation |

(A) A-IV,B-III, C-I, D-II

(B) A-III, B-IV, C-I, D-II

(C) A-IV, B-III, C-II, D-I

(D) A-III, B-IV, C-II, D-I

**Question 116.**

For the reaction A(g) ⇌ 2B(g) the backward reaction rate constant is higher than the forward reaction rate constant by a factor of 2500, at 1000 K. [Given: R = 0.0831 L atm $mol^{-1}K^{-1}$] $K_p$ for the reaction at 1000 K is

[4 Marks]

(A) $2.077 \times 10^5$

(B) 0.021

(C) 0.033

(D) 83.1

**Question 117.**

Given below are two statements :

Statement-I: Benzenediazonium salt is prepared by the reaction of aniline with nitrous acid at 273–278 K. It decomposes easily in the dry state.

Statement-II: Insertion of iodine into the benzene ring is difficult and hence iodobenzene is prepared through the reaction of benzenediazonium salt with KI. In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are correct

(B) Both Statement I and Statement II are incorrect

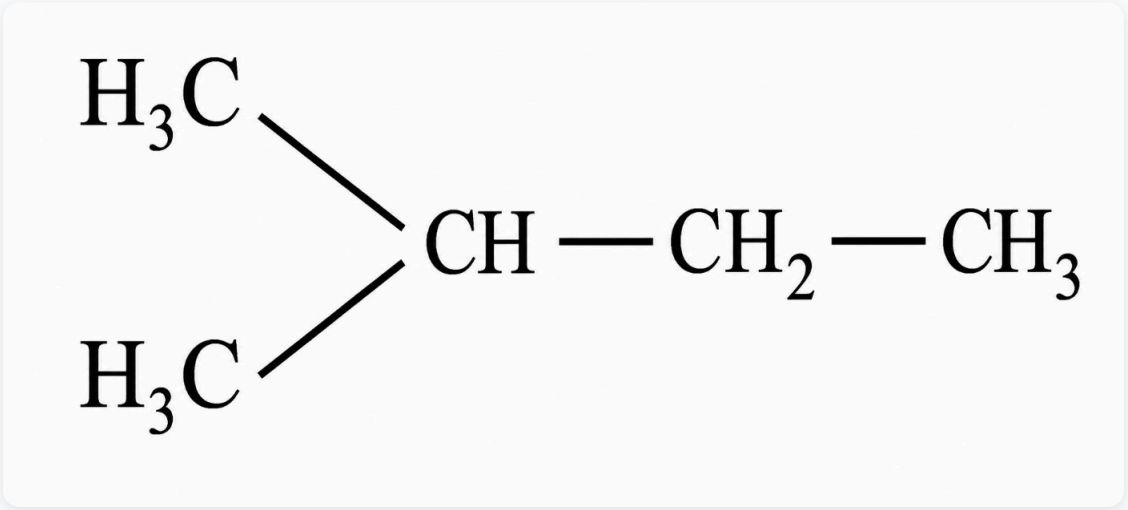
(C) Statement I is correct but Statement II is incorrect

(D) Statement I is incorrect but Statement II is correct

**Question 118.**

How many products (including stereoisomers) are expected from monochlorination of the following compound ?

[4 Marks]




(A) 6

(B) 3

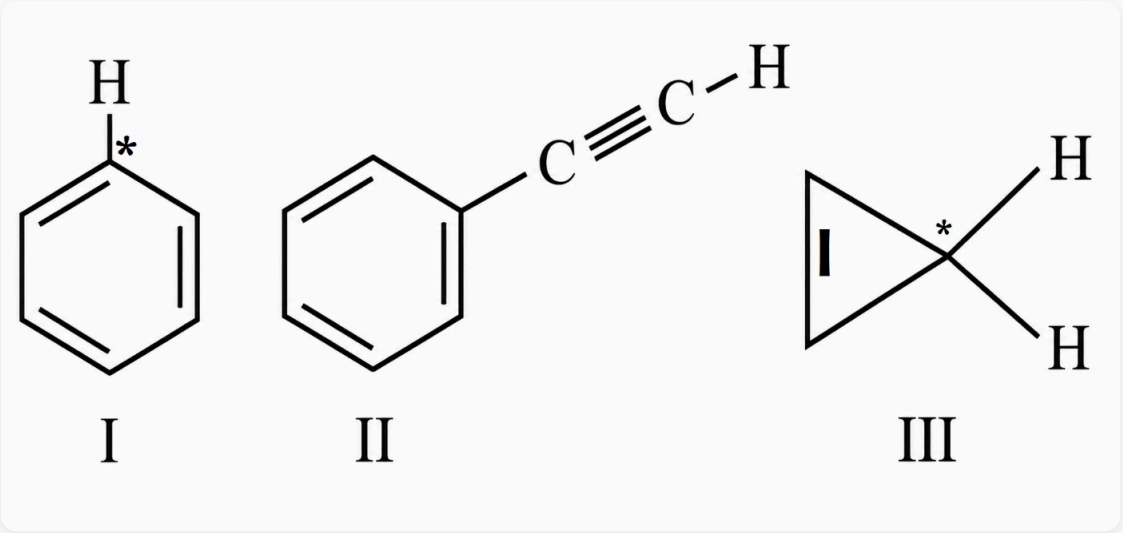
(C) 2

(D) 5

**Question 119.**

Among the given compound I-III, the correct order of bond dissociation energy of C-H bond marked with * is :

[4 Marks]




(A) II > I > III

(B) I > II > III

(C) III > II > I

(D) II > III > I

**Question 120.** Which of the following aqueous solution will exhibit highest boiling point?

[4 Marks]

(A) 0.01 M $Na_2SO_4$

(B) 0.01 M Urea

(C) 0.01 M $KNO_3$

(D) 0.015 M $C_6H_{12}O_6$

**Question 121.** Match List-I with List-II. Choose the correct answer from the options given below:

[4 Marks]

| List-I | List-II |
|---|---|
| A. Haber process | I. Fe catalyst |
| B. Wacker oxidation | II. $PdCl_2$ |
| C. Wilkinson catalyst | III. $[PPh_3]_3RhCl$ |
| D. Ziegler catalyst | IV. $TiCl_4$ with $Al(CH_3)_3$ |

(A) A-II, B-III, C-I, D-IV

(B) A-I, B-II, C-IV, D-III

(C) A-I, B-II, C-III, D-IV

(D) A-I, B-IV, C-III, D-II

**Question 122.**

5 moles of liquid X and 10 moles of liquid Y make a solution having a vapour pressure of 70 torr. The vapour pressures of pure X and Y are 63 torr and 78 torr respectively. Which of the following is true regarding the described solution?

[4 Marks]

(A) The solution has volume greater than the sum of individual volumes.

(B) The solution shows negative deviation.

(C) The solution shows positive deviation.

(D) The solution is ideal.

**Question 123.**

Sugar ‘X’ A. is found in honey. B. is a keto sugar. C. exists in α and β-anomeric forms. D. is laevorotatory. ‘X’ is:

[4 Marks]

(A) Sucrose

(B) Maltose

(C) D-Glucose

(D) D-Fructose

**Question 124.** In the light of the above statements, choose the correct answer from the options given below :

[4 Marks]

**Assertion (A):**  undergoes $S_N2$ reaction faster than 

**Reason (R):** Iodine is a better leaving group because of its large size.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false

(D) A is false but R is true

**Question 125.**

The standard heat of formation, in kcal / $mol^{-1}$, of $Ba^{2+}$ is: {Given: Standard heat of formation of $SO_4^{2-}$ ion (aq) = −216 kcal mol ; Standard heat of crystallisation of $BaSO_4$(s) = −4.5 kcal /mol ; Standard heat of formation of $BaSO_4$(s) = −349 kcal / mol }

[4 Marks]

(A) −133.0

(B) +133.0

(C) +220.5

(D) −128.5

**Question 126.**

Total number of possible isomers (both structural as well as stereoisomers) of cyclic ethers of molecular formula $C_4H_8O$ is :

[4 Marks]

(A) 10

(B) 11

(C) 6

(D) 7

**Question 127.**

Identify the correct orders against the property mentioned

(A) $H_2O > NH_3 > CHCl_3$ — dipole moment

(B) $XeF_4 > XeO_3 > XeF_2$ — number of lone pairs on central atom

(C) O–H > C–H > N–O — bond length

(D) $N_2 > O_2 > H_2$ — bond enthalpy

Choose the correct options given below:

[4 Marks]

(A) A, D only

(B) B, C only

(C) A, C only

(D) B, D only

**Question 128.**

Higher yield of NO in $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$ can be obtained at [$\Delta H$ of the reaction = + 180.7 kJ $mol^{-1}$] A. higher temperature B. lower temperature C. higher concentration of $N_2$ D. higher concentration of $O_2$ Choose the correct answer from the options given below:

[4 Marks]

(A) A, C, D only

(B) B, C, D only

(C) B, C only

(D) A, D only

**Question 129.**

If the rate constant of a reaction is 0.03 $s^{-1}$, how much time does it take for 7.2 mol $L^{-1}$ concentration of the reactant to get reduced to 0.9 mol $L^{-1}$? (Given : log2 = 0.301)

[4 Marks]

(A) 210 s

(B) 21.0 s

(C) 23.1 s

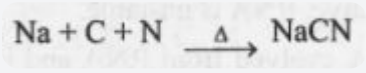
(D) 69.3 s

**Question 130.**

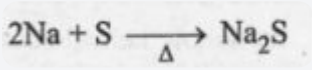
Which one of the following reactions does NOT belong to “Lassaigne’s test”?

[4 Marks]

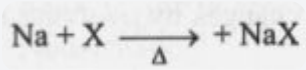
(A)



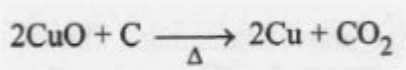
(B)



(C)



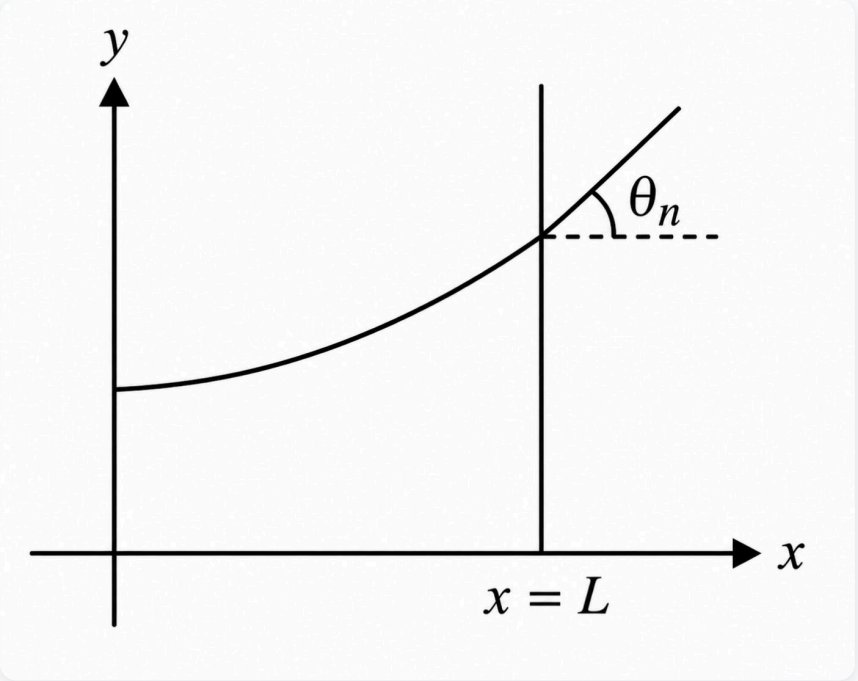
(D)



**Question 131.**

Consider a water tank shown in the figure. It has one wall at x = L and can be taken to be very wide in the z direction. When filled with a liquid of surface tension S and density ρ, the liquid surface makes angle $\theta_0$ ($\theta_0 \ll 1$) with the x-axis at x = L. If y(x) is the height of the surface then the equation for y(x) is: (take θ(x) = sinθ(x) = tanθ(x) = dy/dx, g is the acceleration due to gravity)

[4 Marks]




(A) $d^2y/dx^2 = \rho g/S\ y$

(B) $d^2y/dx^2 = \rho g/S\ x$

(C) $dy/dx = \sqrt{(\rho g/S)}\ x$

(D) $d^2y/dx^2 = \sqrt{(\rho g/S)}$

**Question 132.** A microscope has an objective of focal length 2 cm, eyepiece of focal length 4 cm and the tube length of 40 cm. If the distance of distinct vision of eye is 25 cm, then the magnification of the microscope is:

[4 Marks]

(A) 100

(B) 125

(C) 150

(D) 250

**Question 133.**

An electron (mass $9\times10^{-31}$ kg and charge $1.6\times10^{-19}$ ) moving with speed c/100 (c = speed of light) is injected into a magnetic field □□ of magnitude $9\times10^{-4}$ T perpendicular to its direction of motion. We wish to apply a uniform electric field □□ together with the magnetic field so that the electron does not deflect from its path. Then (speed of light c = $3 \times 10^8$ m $s^{-1}$)

[4 Marks]

(A) □□ is parallel to □□ and its magnitude is 27 x $10^2$ V $m^{-1}$

(B) □□ is perpendicular to □□ and its magnitude is 27 x $10^2$ V $m^{-1}$

(C) □□ is perpendicular to □□ and its magnitude is 27 x $10^4$ V $m^{-1}$

(D) □□ is parallel to □□ and its magnitude is 27 x $10^4$ V $m^{-1}$

**Question 134.**

There are two inclined surfaces of equal length (L) and same angle of inclination 45° with the horizontal. One of them is rough and the other is perfectly smooth. A given body takes 2 times as much time to slide down the rough surface than on the smooth surface. The coefficient of kinetic friction ($\mu_k$) between the object and the rough surface is close to:

[4 Marks]

(A) 0.40

(B) 0.25

(C) 0.75

(D) 0.5

**Question 135.**

The kinetic energies of two similar cars A and B are 100 J and 225 J respectively. On applying brakes, car A stops after 1000 m and car B stops after 1500 m. If F_A and F_B are the forces applied by the brakes on cars A and B, respectively, then the ratio F_A/F_B is:

[4 Marks]

(A) 1/3

(B) 1/2

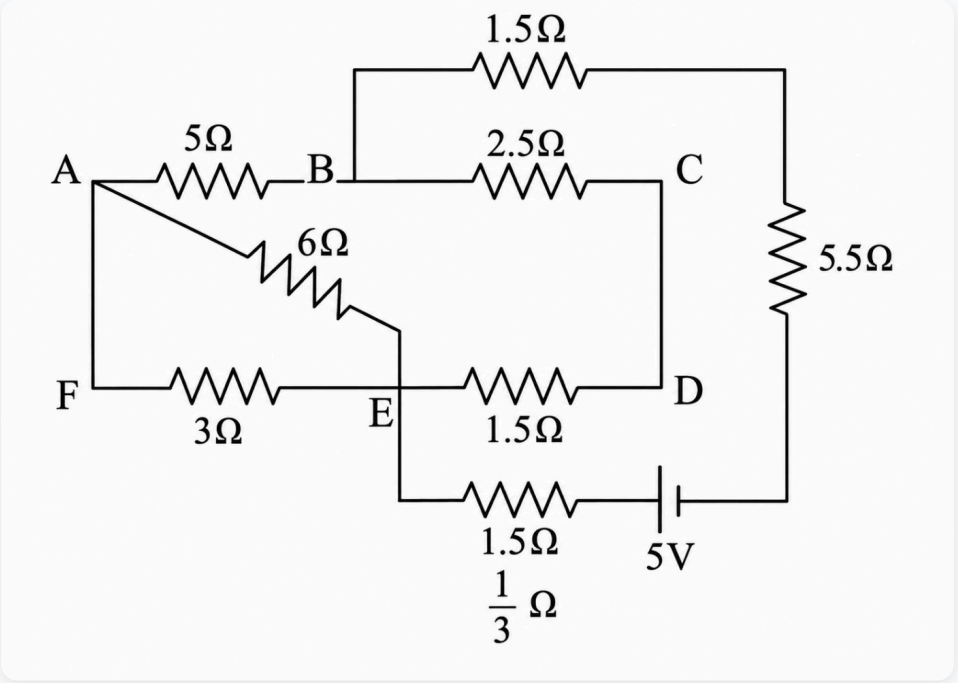
(C) 2/3

(D) 3/2

**Question 136.**

The current passing through the battery in the given circuit,is:

[4 Marks]




(A) 0.5 A

(B) 2.0 A

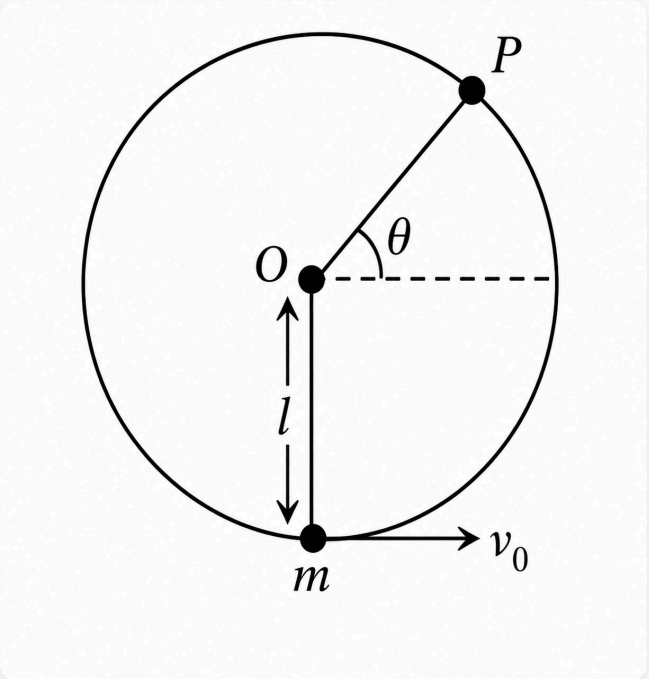
(C) 1.5 A

(D) 2.5 A

**Question 137.**

A bob of heavy mass m is suspended by a light string of length l. The bob is given a horizontal velocity $v_0$ as shown in the figure. If the string gets slack at some point P, making an angle θ from the horizontal, the ratio of the speed v of the bob at point P to its initial speed $v_0$ is:

[4 Marks]



(A) $(\sin \theta)^{1/2}$

(B) $(\sin\theta/ 2+3 \sin \theta)^{1/2}$

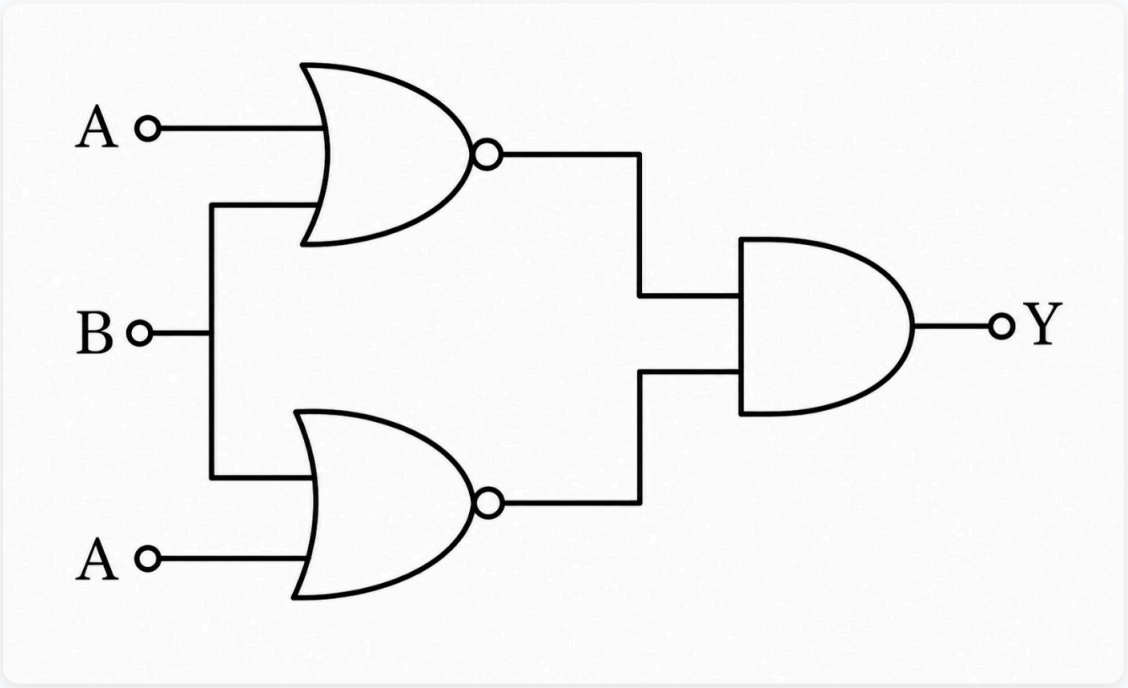
(C) $(\cos \theta/ 2+3 \sin \theta)^{1/2}$

(D) $(1/2+3 \sin \theta)^{1/2}$

**Question 138.**

The output (Y) of the given logic implementation is similar to the output of an/a _____ gate.

[4 Marks]




(A) OR

(B) NOR

(C) NAND

(D) AND

**Question 139.**

The electric field in a plane electromagnetic wave is given by $E_z = 60 \cos(5x + 1.5 \times 10^9 t)$ V/m Then expression for the corresponding magnetic field is (here subscripts denote the direction of the field):

[4 Marks]

(A) $B_z = 60 \cos(5x + 1.5 \times 10^9 t)$ T

(B) $B_y = 60 \sin(5x + 1.5 \times 10^9 t)$ T

(C) $B_x = 2 \times 10^{-7} \cos(5x + 1.5 \times 10^9 t)$ T

(D) B_y = $2 \times 10^{-7} \cos(5x + 1.5 \times 10^9 t)$ T

**Question 140.**

A ball of mass 0.5 kg is dropped from a height of 40 m. The ball hits the ground and rises to a height of 10 m. The impulse imparted to the ball during its collision with the ground is (Take g = 9.8 $m/s^2$)

[4 Marks]

(A) 84 Ns

(B) 0

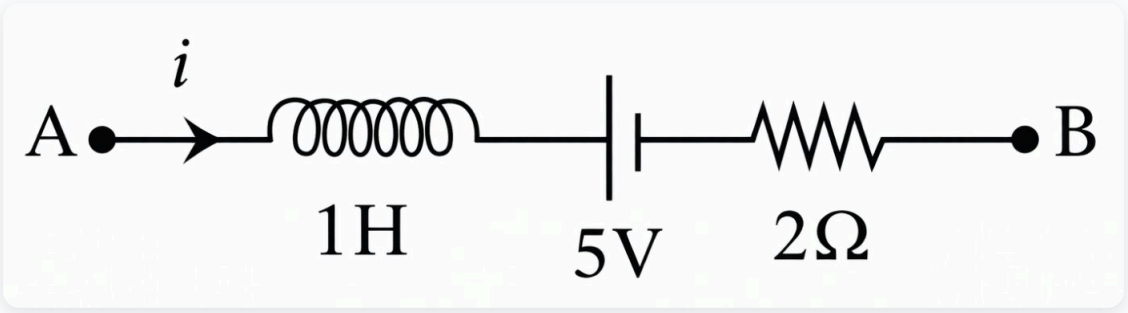
(C) 21 Ns

(D) 7 Ns

**Question 141.**

AB is a part of an electrical circuit (see figure). The potential difference "V_A−V_B" at the instant when current i = 2 A and is increasing at a rate of 1 A/s is:

[4 Marks]




(A) 5 volt

(B) 10 volt

(C) 9 volt

(D) 6 volt

**Question 142.** In a certain camera, a combination of four similar thin convex lenses are arranged axially in contact. Then the power of the combination and the total magnification in comparison to the power (p) and magnification (m) for each lens will be, respectively

[4 Marks]

(A) 4 p and 4 m

(B) $p^4$ and 4 m

(C) $p^4$ and $m^4$

(D) 4 p and $m^4$

**Question 143.** A 2 amp current is flowing through two different small circular copper coils having radii ratio 1 : 2. The ratio of their respective magnetic moments will be

[4 Marks]

(A) 1 : 4

(B) 1 : 2

(C) 2 : 1

(D) 2 : 1

**Question 144.**

An oxygen cylinder of volume 30 litre has 18.20 moles of oxygen. After some oxygen is withdrawn from the cylinder, its gauge pressure drops to 11 atmospheric pressure at temperature 27°C. The mass of the oxygen withdrawn from the cylinder is nearly equal to: [Given, R = 100/12 J $mol^{-1}K^{-1}$ and molecular mass of $O_2$ = 32; 1 atm pressure = $1.01 \times 10^5$ N/m]

[4 Marks]

(A) 0.116 kg

(B) 0.156 kg

(C) 0.144 kg

(D) 0.125 kg

**Question 145.** In some appropriate units, time (t) and position (x) relation of a moving particle is given by $t = x^2 + x$. The acceleration of the particle is

[4 Marks]

(A) $-2/(2x+1)^3$

(B) $-2/(x+2)^3$

(C) $+2/(x+1)^3$

(D) +2/2x+1

**Question 146.** To an AC power supply of 220 V at 50 Hz, a resistor of 20 Ω, a capacitor of reactance 25 Ω and an inductor of reactance 45 Ω are connected in series. The corresponding current in the circuit and the phase angle between the current and the voltage is, respectively:

[4 Marks]

(A) 7.8 A and 30°

(B) 7.8 A and 45°

(C) 15.6 A and 30°

(D) 15.6 A and 45°

**Question 147.** The Sun rotates around its centre once in 27 days. What will be the period of revolution if the Sun were to expand to twice its present radius without any external influence? Assume the Sun to be a sphere of uniform density.

[4 Marks]

(A) 100 days

(B) 105 days

(C) 115 days

(D) 108 days

**Question 148.**

A model for quantized motion of an electron in a uniform magnetic field B states that the flux passing through the orbit of the electron is n(h/e) where n is an integer, h is Planck's constant and e is the magnitude of electron's charge. According to the model, the magnetic moment of an electron in its lowest energy state will be (m is the mass of the electron)

[4 Marks]

(A) heB/2πM

(B) he/2πm

(C) heB/πm

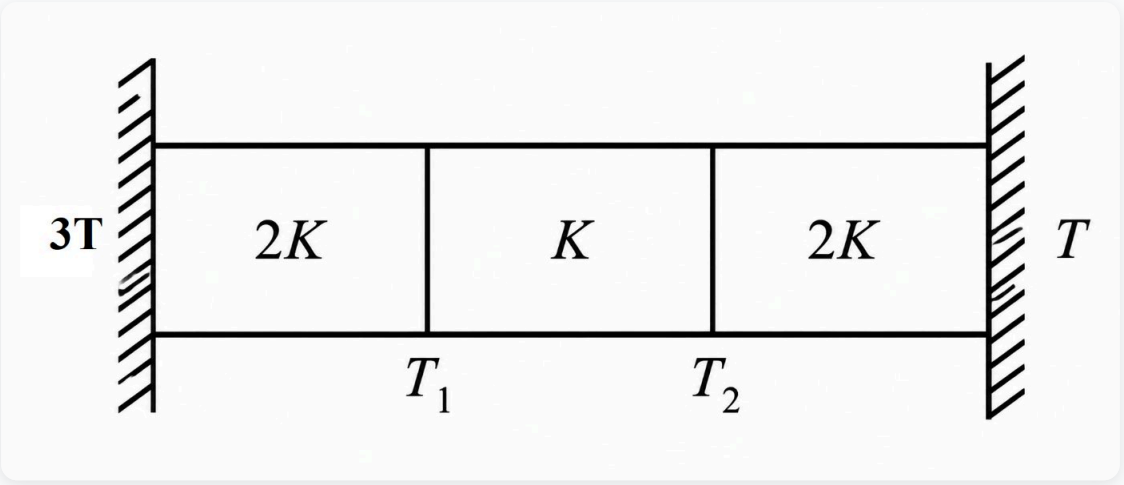
(D) he/πm

**Question 149.**

Three identical heat-conducting rods are connected in series as shown in the figure. The rods on the sides have thermal conductivity 2K while that in the middle has thermal conductivity K. The left end of the combination is maintained at temperature 3T and the right end at T. The rods are thermally

insulated from outside. In steady state, the temperature at the left junction is $T_1$ and that at the right junction is $T_2$. The ratio $T_1/T_2$ is

[4 Marks]




(A) 4/3

(B) 5/3

(C) 3/2

(D) 5/4

**Question 150.**

The plates of a parallel plate capacitor are separated by d. Two slabs of different dielectric constant $K_1$ and $K_2$ with thickness 3/8 d and d/2, respectively are inserted in the capacitor. Due to this, the capacitance becomes two times larger than when there is nothing between the plates. (If $K_1$ = 1.25 $K_2$), the value of $K_1$ is :

[4 Marks]

(A) 1.33

(B) 1.60

(C) 2.33

(D) 2.66

**Question 151.**

Two cities X and Y are connected by a regular bus service with a bus leaving in either direction every T min. A girl is driving scooty with a speed of 60 km/h in the direction X to Y notices that a bus goes past her every 30 minutes in the direction of her motion, and every 10 minutes in the opposite

direction. Choose the correct option for the period of the bus . service and the speed (assumed constant) of the buses.

[4 Marks]

(A) 15 min, 120 km/h

(B) 25 min, 100 km/h

(C) 9 min, 40 km/h

(D) 10 min, 90 km/h

**Question 152.**

A uniform rod of mass 20 kg and length 5 m leans against a smooth vertical wall making an angle of 60° with it. The other end rests on a rough horizontal floor. The friction force that the floor exerts on the rod is (take g = 10 $m/s^2$)

[4 Marks]

(A) 200 √3 N

(B) 200 N

(C) 100 N

(D) 100 √3 N

**Question 153.**

A balloon is made of a material of surface tension S and its inflation outlet (from where gas is filled in it) has a small area A. It is filled with a gas of density ρ and takes a spherical shape of radius R. When the gas is allowed to flow freely out of it, its radius changes from R to 0 (zero) in time T. If the speed v(r) of gas coming out of the balloon depends on r as $r^a$ and T ∝ S^α $A^\beta$ $\rho^\gamma$ $R^\delta$ then

[4 Marks]

(A) a = 1/2, α = -1/2, β = −1, γ = -1/2, δ = 5/2

(B) a = 1/2, α = 1/2, β = −1, γ = +1, δ = 3/2

(C) a = 1/2, α = 1-/2, β = −1, γ = 1/2, δ = 7/2

(D) a = 1/2, α = 1/2, β = −1/2, γ = 1/2, δ = 7/2

**Question 154.**

Consider the diameter of a spherical object being measured with the help of a Vernier calipers. Suppose its 10 Vernier Scale Divisions (V.S.D.) are equal to its 9 Main Scale Divisions (M.S.D.). The least division in the Main Scale is 0.1 cm and the zero of V.S. is at x = 0.1 cm when the jaws of Vernier calipers are closed. If the main scale reading for the diameter is M = 5 cm and the number of coinciding vernier division is 8, the measured diameter after zero error correction is,

[4 Marks]

(A) 5.00 cm

(B) 5.08 cm

(C) 5.18 cm

(D) 4.98 cm

**Question 155.**

A parallel plate capacitor made of circular plates is being charged such that the surface charge density on its plates is increasing at a constant rate with time. The magnetic field arising due to displacement current is:

[4 Marks]

(A) constant between the plates and zero outside the plates

(B) zero at all places

(C) non-zero everywhere with maximum at the imaginary cylindrical surface connecting peripheries of the plates

(D) zero between the plates and non-zero outside

**Question 156.**

An unpolarized light beam travelling in air is incident on a medium of refractive index 1.73 at Brewster's angle. Then

[4 Marks]

(A) both reflected and transmitted light are perfectly polarized with angles of reflection and refraction close to 60° and 30°, respectively

(B) transmitted light is completely polarized with angle of refraction close to 30°

(C) reflected light is completely polarized and the angle of reflection is close to 60°

(D) reflected light is partially polarized and the angle of reflection is close to 30°

**Question 157.**

Two identical charged conducting spheres A and B have their centres separated by a certain distance. Charge on each sphere is q and the force of repulsion between them is F. A third identical uncharged conducting sphere is brought in contact with sphere A first and then with B and finally removed from both. New force of repulsion between spheres A and B (Radii of A and B are negligible compared to the distance of separation so that for calculating force between them they can be considered as point charges) is best given as :

[4 Marks]

(A) 2F/3

(B) 3F/5

(C) 3F/8

(D) F/2

**Question 158.**

A container has two chambers of volumes $V_1$ =2 litres and $V_2$ =3 litres separated by a partition made of a thermal insulator. The chambers contains $n_1$ =5 and $n_2$ = 4 moles of ideal gas at pressures $p_1$ = 1 atm and $p_2$ = 2 atm, respectively. When the partition is removed, the mixture attains an equilibrium pressure of :

[4 Marks]

(A) 1.3 atm

(B) 1.6 atm

(C) 1.4 atm

(D) 1.8 atm

**Question 159.**

A particle of mass m is moving around the origin with a constant force F pulling it towards the origin. If Bohr model is used to describe its motion, the radius r of the $n^{th}$ orbit and the particle's speed v in the orbit depend on n as

[4 Marks]

(A) $r \propto n^{4/3}$; $v \propto n^{1/3}$

(B) $r \propto n^{1/3}$; $v \propto n^{2/3}$

(C) $r \propto n^{1/3}$; $v \propto n^{1/3}$

(D) $r \propto n^{2/3}$; $v \propto n^{1/3}$

**Question 160.** The radius of Martian orbit around the Sun is about 4 times the radius of the orbit of Mercury. The Martian year is 687 Earth days. Then which of the following is the length of 1 year on Mercury ?

[4 Marks]

(A) 88 earth days

(B) 225 earth days

(C) 124 earth days

(D) 172 earth days

**Question 161.**

A body weighs 48 N on the surface of the earth. The gravitational force experienced by the body due to the earth at a height equal to one-third the radius of the earth from its surface is :

[4 Marks]

(A) 36 N

(B) 32 N

(C) 27 N

(D) 16 N

**Question 162.** A wire of resistance R is cut into 8 equal pieces. From these pieces two equivalent resistances are made by adding four of these together in parallel. Then these two sets are added in series. The net effective resistance of the combination is:

[4 Marks]

(A) R/64

(B) R/16

(C) R/32

(D) R/8

**Question 163.**

De-Broglie wavelength of an electron orbiting in the n = 2 state of hydrogen atom is close to (Given Bohr radius = 0.052 nm)

[4 Marks]

(A) 2.67nm

(B) 1.67nm

(C) 0.067 nm

(D) 0.67 nm

**Question 164.**

An electric dipole with dipole moment $5\times10^{-6}$ C m is aligned with the direction of a uniform electric field of magnitude $4\times10^{5}$ N/C. The dipole is then rotated through an angle of 60° with respect to the electric field. The change in the potential energy of the dipole is:

[4 Marks]

(A) 1.5 J

(B) 1.2 J

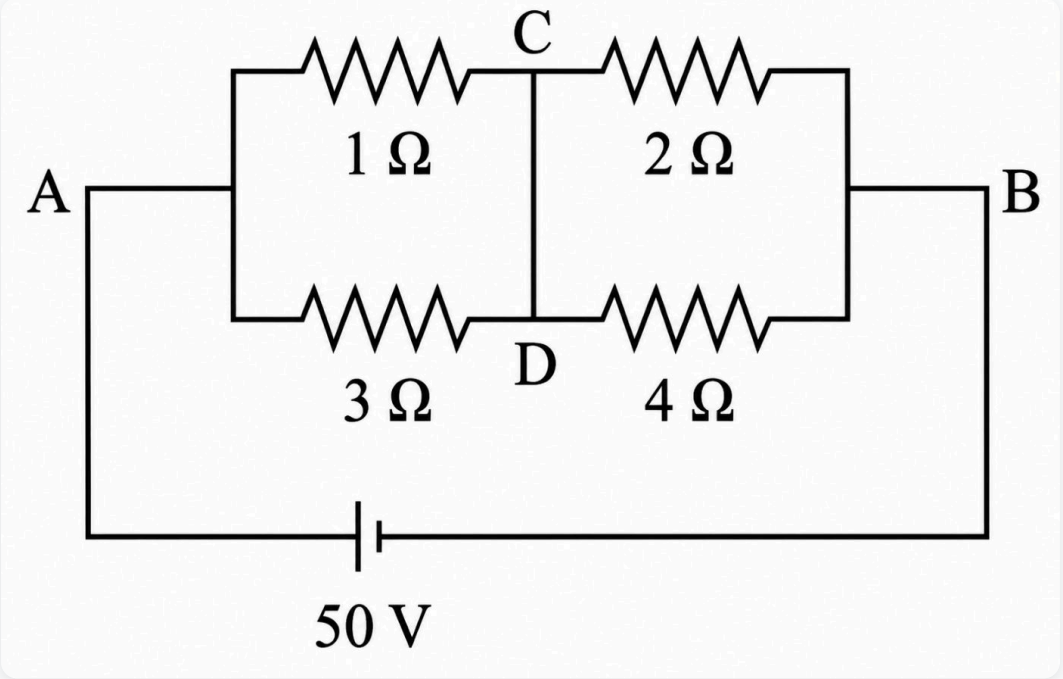
(C) 1.0 J

(D) 0.8 J

**Question 165.**

A constant voltage of 50 V is maintained between the points A and B of the circuit shown in the figure. The current through the branch CD of the circuit is:

[4 Marks]




(A) 2.0 A

(B) 1.5 A

(C) 2.5 A

(D) 3.0 A

**Question 166.**

A photon and an electron (mass m) have the same energy E. The ratio ($\lambda_{photon}$/λ_electron) of their de-Broglie wavelengths is ( c is the speed of light):

[4 Marks]

(A) c√(2m/E)

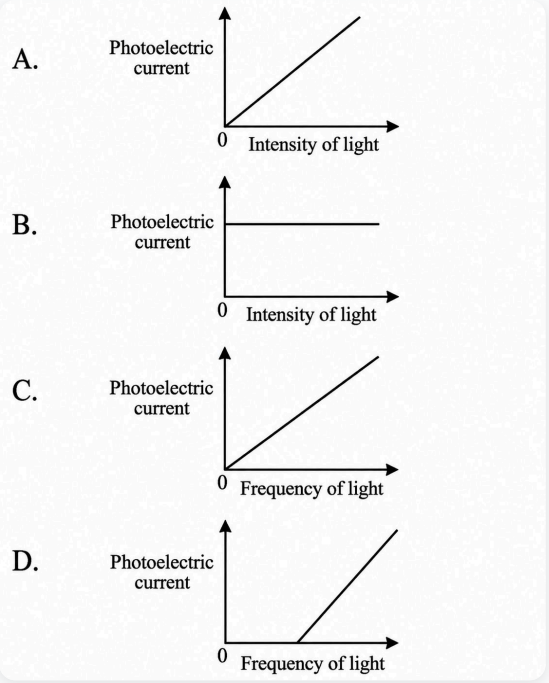
(B) 1/c(E/2m)

(C) c√(2mE)

(D) √(E/2m)

**Question 167.** Which of the following options represent the variation of photoelectric current with property of light shown on the x-axis?

[4 Marks]




(A) A only

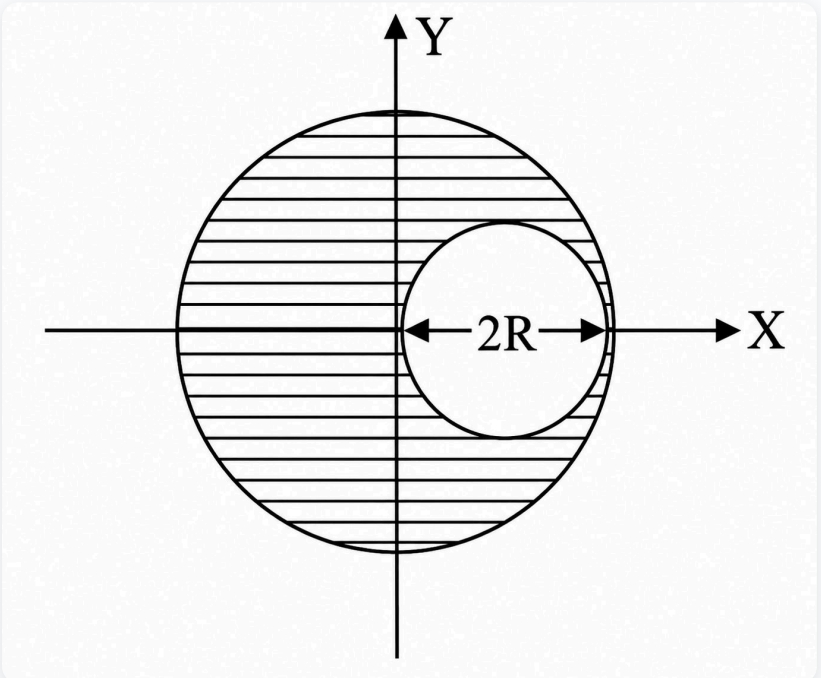
(B) A and C

(C) A and D .

(D) B and C

**Question 168.** A sphere of radius R is cut from a larger solid sphere of radius 2R as shown in the figure. The ratio of the moment of inertia of the smaller sphere to that of the rest part of the sphere about the Y-axis is :

[4 Marks]




(A) 7/8

(B) 7/40

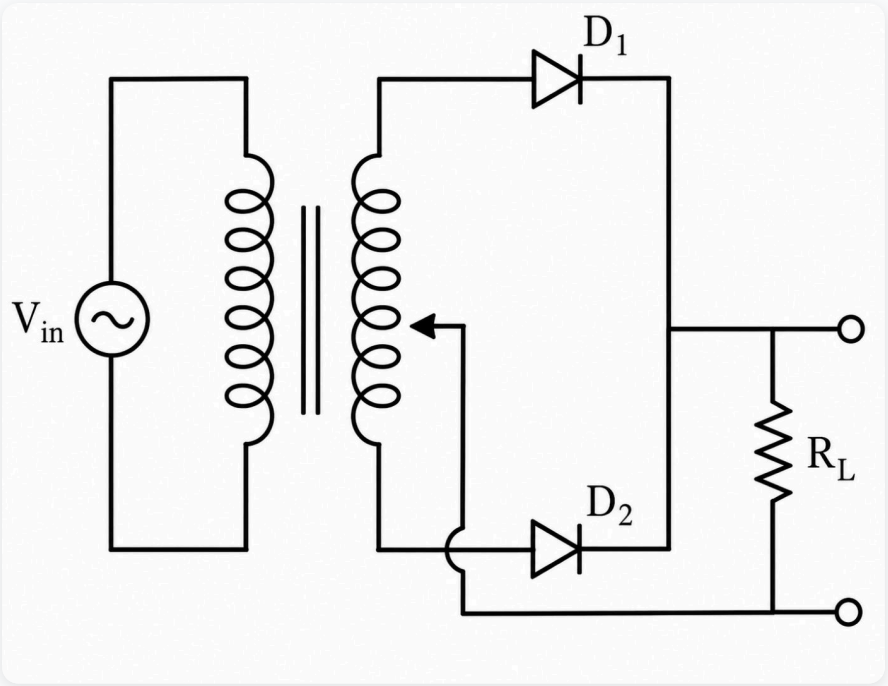
(C) 7/57

(D) 7/64

**Question 169.**

A full wave rectifier circuit with diodes ($D_1$) and ($D_2$) is shown in the figure. If input supply voltage $V_{in}$ =220 sin (100 π t) volt, then at t = 15 msec

[4 Marks]




(A) $D_1$ is forward biased, $D_2$ is reverse biased

(B) $D_1$ is reverse biased, $D_2$ is forward biased

(C) $D_1$ and $D_2$ both are forward biased

(D) $D_1$ and $D_2$ both are reverse biased

**Question 170.**

Two gases A and B are filled at the same pressure in separate cylinders with movable pistons of radius r_A and r_B, respectively. On supplying an equal amount of heat to both the systems reversibly under constant pressure, the pistons of gas A and B are displaced by 16 cm and 9 cm, respectively. If the change in their internal energy is the St e same, then the ratio r_A/r_B is equal to

[4 Marks]

(A) √3/2

(B) $2/\sqrt{3}$

(C) 4/3

(D) 3/4

**Question 171.**

A physical quantity P is related to four observations a, b, c and d as follows: $P = a^3b^2/c\sqrt{d}$

The percentage errors of measurement in a, b, c and d are 1%, 3%, 2% and 4% respectively. The percentage error in the quantity P is

[4 Marks]

(A) 13%

(B) 2%

(C) 15%

(D) 10%

**Question 172.**

The intensity of transmitted light when a polaroid sheet, placed between two crossed polaroids at 22.5° from the polatization axis of one of the polaroid, is ($I_0$ is the intensity of polarised light after passing through the first polaroid):

[4 Marks]

(A) $I_0/16$

(B) $I_0/8$

(C) $I_0/2$

(D) $I_0/4$

**Question 173.**

Two identical point masses P and Q, suspended from two separate massless springs of spring constants $k_1$ and $k_2$, respectively, oscillate vertically. If their maximum speeds A are the same, the ratio (A_Q/A_P) of the amplitude A_Q of mass Q to the amplitude A_P of mass P is :

[4 Marks]

(A) $\sqrt{(k_2/k_1)}$

(B) $\sqrt{(k_1/k_2)}$

(C) $k_1/k_2$

(D) $k_2/k_1$

**Question 174.** A pipe open at both ends has a fundamental frequency f in air. The pipe is now dipped vertically in a water drum to half of its length. The fundamental frequency of the air column is now equal to :

[4 Marks]

(A) f/2

(B) f

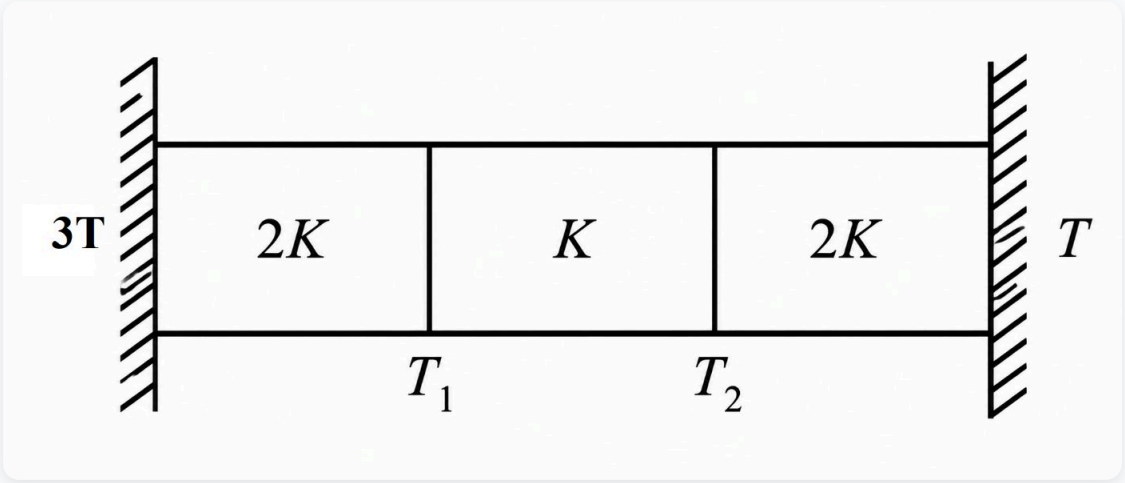
(C) 3f/2

(D) 2f

**Question 175.**

Three identical heat-conducting rods are connected in series as shown in the figure. The rods on the sides have thermal conductivity 2K while that in the middle has thermal conductivity K. The left end of the combination is maintained at temperature 3T and the right end at T. The rods are thermally insulated from outside. In steady state, the temperature at the left junction is $T_1$ and that at the right junction is $T_2$. The ratio $T_1/T_2$ is

[4 Marks]




(A) 4/3

(B) 5/3

(C) 5/4

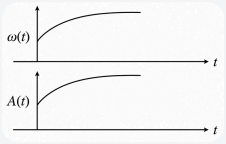
(D) 3/2

**Question 176.**

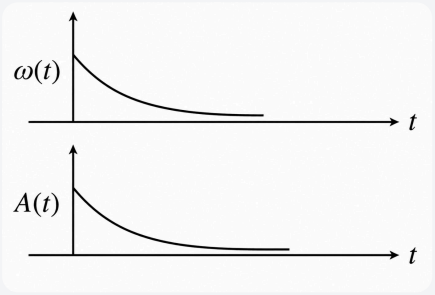
In an oscillating spring mass system, a spring is connected to a box filled with sand. As the box oscillates, sand leaks slowly out of the box vertically so that the average frequency ω (t) and average amplitude A(t) of the system change with time t. Which one of the following options schematically depicts these changes correctly?

[4 Marks]

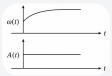
(A)



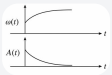

(B)




(C)



(D)



**Question 177.**

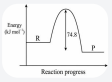
**$C(s) + 2H_2(g) \rightarrow CH_4(g)$; $\Delta H = -74.8\ kJ\ mol^{-1}$**

**Which of the following diagrams gives an accurate representation of the above reaction?**

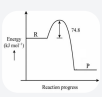
**[R = reactants, P = products]**

[4 Marks]

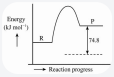
(A)



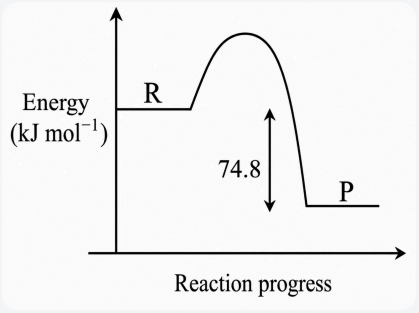

(B)



(C)




(D)




**Question 178.**

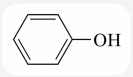
Which one of the following compounds does not decolourize bromine water ?

[4 Marks]

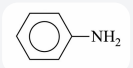
(A)



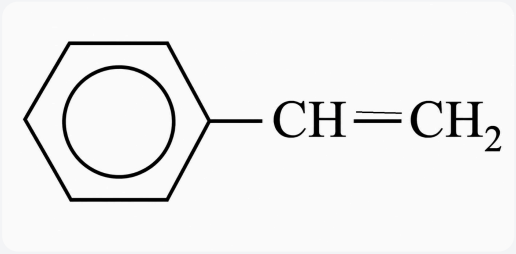
(B)




(C)



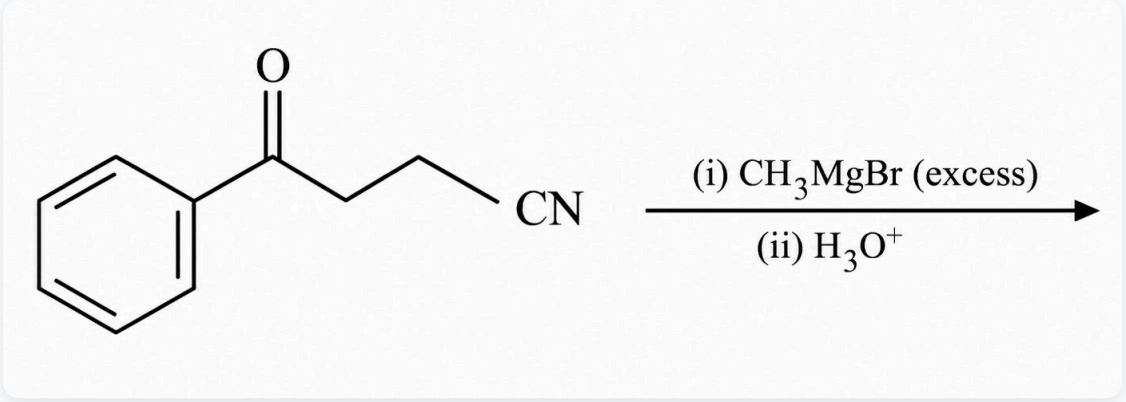

(D)



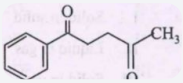

**Question 179.**

The major product of the following reaction is

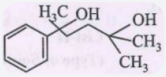
[4 Marks]



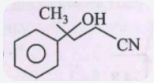

(A)



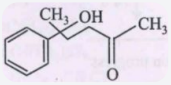
(B)



(C)



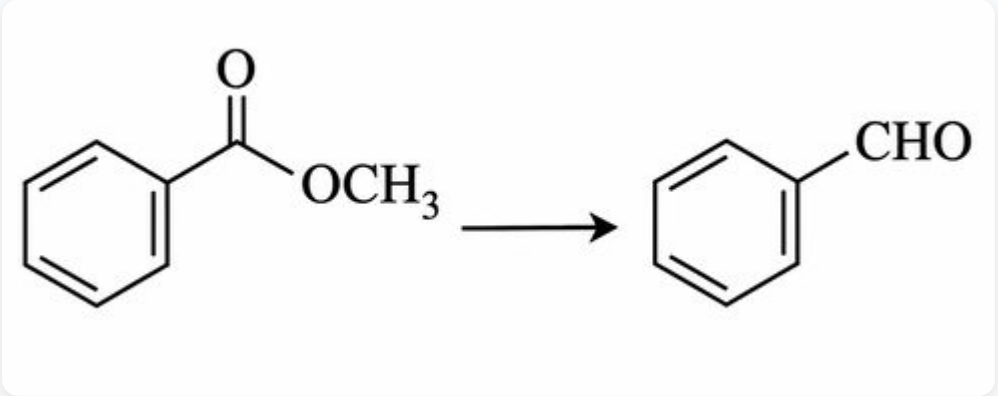
(D)



**Question 180.**

Identify the suitable reagent for the following conversion

[4 Marks]




(A) (i) $LiAlH_4$, (ii) $H^+/H_2O$

(B) (i) $AlH(iBu)_2$, (ii) $H_2O$

(C) $H_2$ / Pd–$BaSO_4$

(D) (i) $NaBH_4$, (ii) $H^+/H_2O$