

27/04/2024



Code-B Phase-1

Aakash

Corporate Office : Aakash Tower, 8, Pusa Road, New Delhi-110005, Ph.011-47623456

MM : 240

Practice Test-2024-25 CF+OYM(P1)-PT01B

P1-02

Time : 60 Min.

Topics Covered:

Physics: Electric Charges & Fields
Chemistry: Solutions

Botany: Sexual Reproduction in Flowering Plants: Introduction, Flower - A fascinating organ of angiosperms, Pre-fertilization - structures and events - Stamen, Microsporangium, Microsporangogenesis, Pollen grain, Development of male gametophyte, The pistil, Megasporangium (ovule), Types of ovules, Megasporeogenesis, Embryo sac/Female gametophyte development, Pollination: Objective, Kinds - Autogamy, Geitonogamy, Xenogamy, Agents of pollination - Wind, Water, Insects

Zoology: Human Reproduction-I: Sex organs, Male reproductive system: Testes, epididymis, Vas deferens, penis, accessory glands of male reproductive system, seminal plasma and semen, Structure of female reproductive system, fallopian tubes, uterus, vagina, female external genitalia and accessory gland of female reproductive system, Structure of mammary glands, spermatogenesis and its hormonal control, structure of mature sperm

General Instructions :

Instructions:

- Use blue/black ballpoint pen only to darken the appropriate circle.
- Mark should be dark and should completely fill the circle.
- Dark only one circle for each entry.
- Dark the circle in the space provided only.
- Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on Answer sheet.
- Each question carries 4 marks. For every wrong response 1 mark shall be deducted from total score.

PHYSICS

1. Unit of electric flux is

- $\text{N m}^2 \text{C}^{-1}$
- $\text{N C}^{-1} \text{m}^{-2}$
- Volt m^2
- Volt m^3

2. Two point charges $4Q$ and Q are fixed 2 m apart. A third charge q_0 is kept between the two charges so that net force on it is zero. The separation between charge q_0 and $4Q$ is

- $\frac{2}{3} \text{ m}$
- 1 m
- $\frac{1}{3} \text{ m}$
- $\frac{4}{3} \text{ m}$

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4. An electric dipole, when held at 60° with respect to a uniform electric field 10^4 N/C , experiences a torque of $\sqrt{3} \times 10^{-21} \text{ N m}$. Calculate dipole moment of the dipole.

- $4 \times 10^{-21} \text{ C-m}$
- $2 \times 10^{-8} \text{ C-m}$
- $2 \times 10^{-28} \text{ C-m}$
- $\sqrt{3} \times 10^{-16} \text{ C-m}$

5. Two point charges $+6 \mu\text{C}$ and $+16 \mu\text{C}$ repel each other with a force of 120 N. If a charge of $-8 \mu\text{C}$ is added to each of them, then force between them will become

- 40 N
- 30 N
- 20 N
- 60 N

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6. Two parallel infinite line charges λ and $-\lambda$ are placed at a separation $2a$ in free space. The net electric field intensity exactly midway between the two line charges is

- Zero
- $\frac{\lambda}{\pi\epsilon_0 a}$
- $\frac{\lambda}{2\pi\epsilon_0 a}$
- $\frac{2\lambda}{\pi\epsilon_0 a}$

Which of the following statements is correct?

- A charge particle in electric field must experience force in the direction of electric field.
- Electrostatic lines of forces never form closed loops.
- Force of interaction between two points charges is affected by the presence of other charges.
- All of the above

7. An electron and proton are placed in uniform electric field
 (1) The electric forces acting on them will be equal
 (2) The magnitudes of the forces will be equal
 (3) The acceleration will be equal
 (4) The magnitudes of their accelerations will be equal
8. The electric field at a distance r from an electric dipole at its axial position is proportional to
 (1) $\frac{1}{r}$
 (2) $\frac{1}{r^2}$
 (3) $\frac{1}{r^3}$
 (4) $\frac{1}{r^4}$
9. A point charge $+q$ is placed at centre of a cube of side l . The electric flux emerging from its one surface will be
 (1) $\frac{q}{\epsilon_0}$
 (2) $\frac{q}{6\epsilon_0}$
 (3) $\frac{q}{8\epsilon_0}$
 (4) $\frac{q}{\epsilon_0}$
10. Which of the following is not a property of electric charge?
 (1) Scalar addition
 (2) Charge is conserved for an isolated body
 (3) Charge is quantized
 (4) Conversion of charge into mass
11. Two equally charged particles are placed at a separation of 10 m. If electrostatic force between them is 0.9 N, then find charge on each particle?
 (1) 100 μC
 (2) 10 μC
 (3) 1 μC
 (4) 10⁴ μC
12. What is the approximate electric field strength at a point charge of 5 μC at a distance of 2 m?
 (1) 112 kN/C
 (2) 11 kN/C
 (3) 123 kN/C
 (4) 15 kN/C
13. Force between two point charges kept at a fixed separation is F . If distance between point charges is made 1.5 times of initial value, then new force of attraction/repulsion acting between them becomes
 (1) $\frac{9}{4}F$
 (2) $\frac{1}{9}F$
 (3) $\frac{2}{3}F$
 (4) $3\frac{1}{2}F$
14. Which of the following statements is true regarding electric charges?
 (1) Like charges attract, and unlike charges repel
 (2) Like charges repel, and unlike charges attract
 (3) Both like and unlike charges attract
 (4) Both like and unlike charges repel
15. A point charge of 100 μC is situated at the origin. The magnitude of electric field at a location having position vector $(3\hat{i} + 4\hat{j})$ m is
 (1) 36 kN/C
 (2) 2 kN/C
 (3) 40 kN/C
 (4) 200 N/C
16. The gas used in tanks by scuba divers for breathing contains
 (1) 78% N_2 , 21% O_2 and 1% He
 (2) 11.7% He, 58% N_2 and 30.3% O_2
 (3) 32.1% O_2 and 67.1% He
 (4) 11.7% He, 56.2% N_2 and 32.1% O_2
17. The solution which forms minimum boiling azeotrope is
 (1) $\text{CHCl}_3 + \text{C}_6\text{H}_6$
 (2) $\text{CH}_3\text{COCH}_3 + \text{C}_6\text{H}_5\text{NH}_2$
 (3) $\text{HCl} + \text{H}_2\text{O}$
 (4) $\text{C}_2\text{H}_5\text{OH} + \text{H}_2\text{O}$
18. A 10% aqueous solution (by mass) of urea has boiling point 374.11 K. The boiling point of 10% glucose in water is (Boiling point of water is 373.15 K)
 (1) 373.47 K
 (2) 375.25 K
 (3) 374.91 K
 (4) 373.15 K
19. The temperature independent concentration term is
 (1) Molarity
 (2) Mole fraction
 (3) Normality
 (4) % (w/v)

CHEMISTRY

20. van't Hoff factor i for acetic acid in water and benzene respectively are

- (1) Greater than unity and greater than unity
- (2) Less than unity and greater than unity
- (3) Greater than unity and less than unity
- (4) Less than unity and less than unity

21. The Osmotic pressure of 0.1 M solution of glucose at 27°C is

- (1) 1.5 atm
- (2) 0.75 atm
- (3) 3.5 atm
- (4) 2.46 atm

22. If the mole fraction of acetone in ethyl alcohol is 0.2 then the molality of acetone in the solution is

- (1) 5.9 m
- (2) 5.4 m
- (3) 7.8 m
- (4) 2.7 m

23. Which of the following is correct for an aqueous solution of benzene and toluene at 298 K ?

- (1) $\Delta_{\text{mix}}H = 0$
- (2) $\Delta_{\text{mix}}V > 0$
- (3) $\Delta_{\text{mix}}G > 0$
- (4) $\Delta_{\text{mix}}S < 0$

24. For an aqueous solution of $\text{K}_4[\text{Fe}(\text{CN})_6]$ (strong electrolyte) the van't Hoff factor (i) will be

- (1) 1
- (2) 3
- (3) 5
- (4) 5

25. If the molality of the solution is 0.70, then relative lowering of the vapour pressure of an aqueous solution containing non-volatile solute is approximately

- (1) 0.01
- (2) 0.50
- (3) 0.80
- (4) 0.40

26. Isotonic solutions have same

- (1) Boiling temperature
- (2) Vapour pressure
- (3) Freezing temperature
- (4) Osmotic pressure

27. The freezing point depression constant (K_f) of benzene is $5.12\text{ K kg mol}^{-1}$. The freezing point depression for the solution of molality 0.078 m containing a non-electrolyte solute in benzene is

- (1) 0.80 K
- (2) 0.40 K
- (3) 0.60 K
- (4) 0.20 K

28. The vapour pressure of a pure liquid 'A' is 40 mm Hg at 25°C . It forms an ideal solution with another liquid B. The mole fraction of B is 0.4 and total vapour pressure of the solution is 70 mm Hg. So, the vapour pressure of pure liquid, B at the same temperature is

- (1) 115 mm Hg
- (2) 80 mm Hg
- (3) 90 mm Hg
- (4) 125 mm Hg

29. Desalination of sea water can be done by

- (1) Filtration
- (2) Osmosis
- (3) Reverse osmosis
- (4) Diffusion

30. Consider the following statements labelled as assertion (A) and Reason (R).

Assertion (A) : Aquatic species are more comfortable in cold water rather than in warm water.

Reason (R) : Solubility of a gas in a liquid increases with decrease in temperature.

In the light of above statements, choose the correct option.

- (1) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- (2) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- (3) Assertion is correct statement but reason is wrong statement.
- (4) Assertion is wrong statement but reason is correct statement.

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BOTANY

All the following plants have flowers producing assured seed set even in the absence of pollinators, except

- (1) Yucca
- (2) Oxalis
- (3) Viola
- (4) Commelina

32. Formation of embryo sac from a single megaspore nucleus is called _____ development

- (1) Polysporic
- (2) Monosporic
- (3) Bisporic
- (4) Tetrasporic

33. The outer layer of sporoderm helps in fossilization of pollen grain due to
 (1) Cellulose
 (2) Sporopollenin
 (3) Pectin
 (4) Chitin
34. Ploidy level of nucellus and female gametophyte is respectively
 (1) n, n
 (2) $n, 2n$
 (3) $2n, n$
 (4) $2n, 2n$
35. Closed flowers show
 (1) Geitonogamy only
 (2) Either autogamy or geitonogamy
 (3) Either geitonogamy or xenogamy
 (4) Autogamy only
36. The point of attachment of funicle with body of the ovule is called
 (1) Placenta
 (2) Integument
 (3) Chalaza
 (4) Hilum
37. Inner thin layer of the cell wall of pollen grain is made up of
 (1) Cellulose and pectin
 (2) Sporopollenin only
 (3) Most resistant organic material
 (4) Lipids and sporopollenin
38. Which of the following features is not related to the wind pollinated plants?
 (1) Light and non-sticky pollen grains
 (2) Presence of single ovule in each ovary
 (3) Presence of nectaries
 (4) Flowers having well exposed stamens
39. An ovary contains single ovule in
 (1) Wheat
 (2) Papaya
 (3) Watermelon
 (4) Orchids
40. Which of the following plants is pollinated by insects?
 (1) Zostera
 (2) Vallisneria
 (3) Sea grass
 (4) Water hyacinth
41. A typical angiospermic embryo sac, at maturity is
 (1) 8-nucleate and 7-celled
 (2) 7-nucleate and 8-celled
 (3) 7-celled and 7-nucleate
 (4) 8-celled and 8-nucleate
42. Number of antipodal cells in most of the flowering plants is
 (1) Five
 (2) Two
 (3) Three
 (4) Four
43. Which of the following layer usually have cells with dense cytoplasm and more than one nucleus?
 (1) Middle layers
 (2) Tapetum
 (3) Endothecium
 (4) Epidermis
44. In the young anther, centre of each microsporangium is occupied by
 (1) Compactly arranged heterogeneous cells
 (2) Compactly arranged homogenous cells
 (3) Loosely arranged homogenous cells
 (4) Loosely arranged heterogeneous cells
45. The another name of ovule is
 (1) Megaspore
 (2) Megasporangium
 (3) Male gametophyte
 (4) Embryo sac

46. The structure that extends through the penis is
 (1) Urethra
 (2) Urinary bladder
 (3) Seminal vesicle
 (4) Testis

47. Scrotum helps in maintaining a temperature of the testes which is A lower than the internal body temperature. Each testis has about B compartments called testicular lobules.
 Select the option that fills the blanks correctly.
 (1) A - $1-3^{\circ}\text{C}$, B - 300
 (2) A - $2-2.5^{\circ}\text{C}$, B - 250
 (3) A - $3-3.5^{\circ}\text{C}$, B - 250
 (4) A - $2-2.5^{\circ}\text{C}$, B - 350

48. Vas deferens receives a duct from seminal vesicle and opens into urethra as
 (1) Rete testis
 (2) Ureter
 (3) Ejaculatory duct
 (4) Vasa efferentia
49. Secretion of which of the following glands helps in the lubrication of penis?
 (1) Prostate gland
 (2) Sweat gland
 (3) Seminal vesicles
 (4) Bulbourethral glands
50. Read the following statements and choose the correct option.
 Statement-A : Seminiferous tubules are lined by male germ cells, Sertoli cells and Leydig cells.
 Statement-B : Sertoli cells secrete androgens called ICSH.
 (1) Both statements are correct
 (2) Only statement A is correct
 (3) Only statement B is correct
 (4) Both statements are incorrect
51. The narrow part of the fallopian tube closest and linked to the uterus is
 (1) Infundibulum
 (2) Fimbriae
 (3) Ampulla
 (4) Isthmus
52. Paired structures in female reproductive system exclude
 (1) Ovary
 (2) Fallopian tubes
 (3) Mammary glands
 (4) Uterus
53. After ovulation, ovum is released from ovary into
 (1) Coelom
 (2) Infundibulum
 (3) Fallopian tube
 (4) Uterus
54. Which structure lies at the upper junction of the two labia minora above the urethral opening?
 (1) Mons pubis
 (2) Labia majora
 (3) Oviduct
 (4) Clitoris
55. In majority of sexually reproducing organisms, the gametes produced are of morphologically two distinct types. They don't differ generally on the basis of
 (1) Motility
 (2) Size
 (3) Chromosome number
 (4) Amount of cytoplasm
56. In a mammalian sperm, spirally arranged mitochondria are present in
 (1) Head portion
 (2) Middle piece
 (3) End piece of the tail
 (4) Principal piece of tail
57. All of the following structures are included in female accessory ducts, except
 (1) Fallopian tubes
 (2) Vagina
 (3) Labia minora
 (4) Uterus
58. In human female, the correct route of passage of milk is
 (1) Mammary tubule - Mammary duct - Mammary alveoli - Mammary ampulla - Lactiferous duct
 (2) Mammary duct - Mammary tubule - Mammary alveoli - Mammary ampulla - Lactiferous duct
 (3) Mammary alveoli - Mammary tubule - Mammary duct - Mammary ampulla - Lactiferous duct
 (4) Mammary ampulla - Mammary tubule - Mammary duct - Mammary alveoli - Lactiferous duct
59. Which of the following cells can have either $22 + X$ or $22 + Y$ chromosomes?
 (1) Primary spermatocyte
 (2) Sperm
 (3) Primary oocyte
 (4) Cells of secondary follicle
60. Choose the correct sequence of events in human reproduction.
 Gametogenesis → Syngamy → Insemination →
 (1) Zygote → Cleavage → Cell differentiation → Organogenesis
 Gametogenesis → Insemination → Syngamy →
 (2) Zygote → Cleavage → Organogenesis → Cell differentiation
 Gametogenesis → Insemination → Syngamy →
 (3) Zygote → Cleavage → Cell differentiation → Organogenesis
 Gametogenesis → Insemination → Syngamy →
 (4) Zygote → Cell differentiation → Cleavage → Organogenesis



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Time : 60 Min

PHYSICS

1. (1)
2. (4)
3. (2)
4. (3)
5. (3)
6. (2)
7. (2)
8. (3)

9. (4)
10. (4)
11. (1)
12. (2)
13. (2)
14. (2)
15. (1)

CHEMISTRY

16. (4)
17. (4)
18. (1)
19. (2)
20. (3)
21. (4)
22. (2)
23. (1)

24. (4)
25. (1)
26. (4)
27. (2)
28. (1)
29. (3)
30. (1)

BOTANY

31. (1)
32. (2)
33. (2)
34. (3)
35. (4)
36. (4)
37. (1)
38. (3)

39. (1)
40. (4)
41. (1)
42. (3)
43. (2)
44. (2)
45. (2)

ZOOLOGY

46. (1)
47. (2)
48. (3)
49. (4)
50. (4)
51. (4)
52. (4)
53. (1)

54. (4)
55. (3)
56. (2)
57. (3)
58. (3)
59. (2)
60. (3)



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