

## PRABAL TEST PAPER

Time : 1 : 00 Hr.

Question : 50

### PHYSICS

01. **Statement-I** : Beam of electron contains wave nature.  
**Statement-II** : The above fact is discovered by Davison-Germer.

- (1) S-I is false, S-II is true  
(2) S-I is true, S-II is false  
(3) S-I is true, S-II is true  
(4) S-I is false, S-II is false

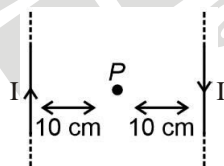
02. The largest wavelength of radiation that can cause photoelectric emission from a metal having work function 4.13 eV is

- (1) 124 nm                      (2) 620 nm  
(3) 300 Å                      (4) 300 nm

03. In a photoelectric effect experiment, the slope of the graph between the stopping potential and the incident frequency will be

- (1)  $10^{-14}$                       (2)  $5 \times 10^{-14}$   
(3)  $4 \times 10^{-15}$                       (4)  $4 \times 10^{-34}$

04. Two infinite current carrying wires having current  $I$  in opposite directions are shown below. Find the magnetic field (in S.I. units) at point P.



- (1)  $\frac{7\mu_0 I}{\pi}$                       (2)  $\frac{10\mu_0 I}{\pi}$   
(3)  $\frac{5\mu_0 I}{\pi}$                       (4)  $\frac{\mu_0 I}{\pi}$

05. Charge  $q$  is uniformly spread on a thin ring of radius  $R$ . The ring rotates about its axis with a uniform frequency  $f$  Hz. The magnitude of magnetic induction at the center of the ring is:

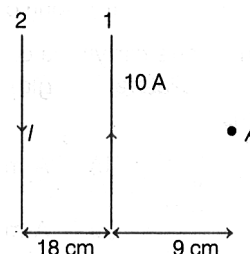
(1)  $\frac{\mu_0 q f}{2R}$                       (2)  $\frac{\mu_0 q}{2fR}$

(3)  $\frac{\mu_0 q}{2\pi f R}$                       (4)  $\frac{\mu_0 q f}{2\pi R}$

06. A square current carrying loop is suspended in a uniform magnetic field acting in the plane of the loop. If the force on one arm of the loop is  $\vec{F}$  the net force on the remaining three arms of the loop is:

- (1)  $-3\vec{F}$                       (2)  $\vec{F}$   
(3)  $3\vec{F}$                       (4)  $-\vec{F}$

07. In figure, two parallel infinitely long current carrying wires are shown. If resultant magnetic field at point A is zero, then determine the value of current  $I$



- (1) 50 A                      (2) 15 A  
(3) 30 A                      (4) 25 A

08. **Assertion (A)**: The magnetic field induction due to an infinite long current carrying solid cylindrical conductor of radius  $R$ , at a distance  $R/2$  and  $2R$  from its axis is same.

**Reason (R)**: An infinite long current carrying solid cylindrical conductor is a source of uniform magnetic field.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)  
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)  
(3) (A) is true but (R) is false  
(4) Both (A) and (R) are false

09.  $K_1$  and  $K_2$  are maximum kinetic energies of photoelectrons emitted when radiation of wavelength  $\lambda_1$  and  $\lambda_2$  respectively are incident on a metallic surface. If  $\lambda_1 = 5\lambda_2$  then

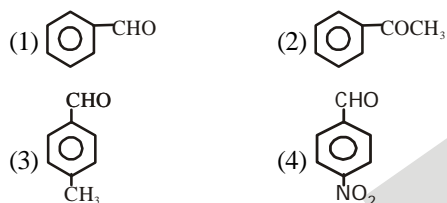
(1)  $K_1 > \frac{K_2}{5}$                       (2)  $K_1 < \frac{K_2}{5}$   
 (3)  $K_1 = 5K_2$                       (4)  $K_2 = 5K_1$

10. A current loop consists of two identical semicircular parts each of radius  $R$ , one lying in the  $x$ - $y$  plane and the other in  $x$ - $z$  plane. If the current in the loop is  $i$ . The resultant magnetic field due to the two semicircular parts at their common centre is:

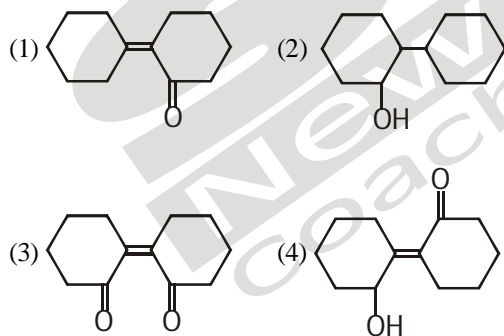
(1)  $\frac{\mu_0 i}{4R}$       (2)  $\frac{\mu_0 i}{\sqrt{2}R}$       (3)  $\frac{\mu_0 i}{2\sqrt{2}R}$       (4)  $\frac{\mu_0 i}{2R}$

## CHEMISTRY

11. Which one is most reactive towards nucleophilic addition reaction?



12. Of the following, which is the product formed when cyclohexanone undergoes aldol condensation followed by heating

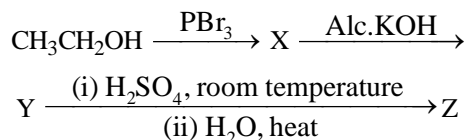


13. Match List-I with List-II.

	List-I (Products formed)		List-II (Reaction of carbonyl compound with)
(a)	Cyanohydrin	(i)	$\text{NH}_2\text{OH}$
(b)	Acetal	(ii)	$\text{RNH}_2$
(c)	Schiff's base	(iii)	alcohol
(d)	Oxime	(iv)	$\text{HCN}$

- (1) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)  
 (2) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)  
 (3) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)  
 (4) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

14. Consider the following reaction,



The product Z is,

- (1)  $\text{CH}_2 = \text{CH}_2$   
 (2)  $\text{CH}_3\text{CH}_2\text{-O-CH}_2\text{CH}_3$   
 (3)  $\text{CH}_3\text{CH}_2\text{-O-SO}_3\text{H}$   
 (4)  $\text{CH}_3\text{CH}_2\text{OH}$

15. Given below are two statements:

**Statement I:** The acidic strength of monosubstituted nitrophenol is higher than phenol because of electron withdrawing nitro group.

**Statement II:** o-nitrophenol, m-nitrophenol and p-nitrophenol will have same acidic strength as they have one nitro group attached to the phenolic ring.

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

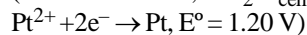
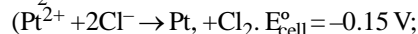
- (1) Both Statement I and Statement II are incorrect.  
 (2) Statement I is correct but Statement II is incorrect.  
 (3) Statement I is incorrect but Statement II is correct  
 (4) Both Statement I and Statement II are correct.

16. **Assertion:** The boiling point of ethanol is much higher than that of diethyl ether.

**Reason:** In ethanol, the molecules are associated due to inter-molecular hydrogen bonding, whereas in diethyl ether it is not possible.

- (1) Assertion and reason are true and reason is the correct explanation of assertion.  
 (2) Assertion and reason are true but reason is not the correct explanation of assertion.  
 (3) Assertion is true but reason is false.  
 (4) Assertion and reason are false.

17. The standard reduction potential for the half-cell reaction,  $\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$  will be



- (1)  $-1.35 \text{ V}$                       (2)  $+1.35 \text{ V}$   
 (3)  $-1.05 \text{ V}$                       (4)  $+1.05 \text{ V}$

18. A standard hydrogen electrode has a zero potential. because

- (1) hydrogen can be most easily oxidised  
 (2) hydrogen has only one electron  
 (3) the electrode potential is assumed to be zero  
 (4) hydrogen is the lightest element.

19. Which of the following is the correct order in which metals displace each other from the salt solution of their salts?  
 (1) Zn, Al, Mg, Fe, Cu  
 (2) Cu, Fe, Mg, Al, Zn  
 (3) Mg, Al, Zn, Fe, Cu  
 (4) Al, Mg, Fe, Cu, Zn
20. Electrode potential data of few cells is given below. Based on the data, arrange the ions in increasing order of their reducing power.  
 $\text{Fe}_{(\text{aq})}^{3+} + \text{e}^- \rightarrow \text{Fe}_{(\text{aq})}^{2+}; E^\circ = +0.77 \text{ V}$   
 $\text{Al}_{(\text{aq})}^{3+} + 3\text{e}^- \rightarrow \text{Al}_{(\text{s})}; E^\circ = -1.66 \text{ V}$   
 $\text{Br}_{2(\text{aq})} + 2\text{e}^- \rightarrow 2\text{Br}_{(\text{aq})}^-; E^\circ = +1.09 \text{ V}$   
 (1)  $\text{Br}^- < \text{Fe}^{2+} < \text{Al}$   
 (2)  $\text{Fe}^{2+} < \text{Al} < \text{Br}^-$   
 (3)  $\text{Al} < \text{Br}^- < \text{Fe}^{2+}$   
 (4)  $\text{Al} < \text{Fe}^{2+} < \text{Br}^-$

## BOTANY

21. In 1900 CE, three biologists independently discovered Mendel's principles. They are  
 (1) De Vries, Correns and Tschermak  
 (2) Sutton, Morgan and Bridges  
 (3) Avery, MacLeod and McCarty  
 (4) Bateson, Punnett and Bridges
22. When a true breeding pea plant that has yellow seeds is pollinated by a plant that has green seeds, then all the  $F_1$  plants have yellow seeds. This means that the allele for yellow is  
 (1) Heterozygous (2) Dominant  
 (3) Recessive (4) Lethal
23. In dihybrid cross, out of 16 plants obtained in  $F_2$  generation, the number of genotypes will be  
 (1) 4 (2) 9 (3) 16 (4) 12
24. In Morgan's experiment, what will be the percentage of recombination in case of body colour and eye colour?  
 (1) 37.2% (2) 1.3% (3) 98.7% (4) 62.8%
25. In a dihybrid cross  $\text{AABB} \times \text{aabb}$ ,  $F_2$  progeny of  $\text{AABB}$ ,  $\text{AABb}$ ,  $\text{AaBB}$  and  $\text{AaBb}$  occurs in the ratio of  
 (1) 1 : 1 : 1 : 1 (2) 9 : 3 : 3 : 1  
 (3) 1 : 2 : 2 : 1 (4) 1 : 2 : 2 : 4
26. Choose the correct option with regard to statements (a) and (b).  
 (a) Lactic acid bacteria (LAB) is responsible for converting milk into curd.  
 (b) LAB create acidic medium necessary to coagulate and fully digest the milk proteins.  
 (1) Both statements (a) and (b) are true.  
 (2) Both statements (a) and (b) are false.  
 (3) Statement (a) is true, but (b) is false.  
 (4) Statement (b) is true, but (a) is false.
27. Which of the following statements are correct?  
 (a) Wine and beer are produced without distillation of fermented broth.  
 (b) Wine and beer are produced with distillation of fermented broth.  
 (c) Whisky brand and rum are produced by distillation of fermented broth.  
 (d) Whisky brand and rum are produced without distillation of fermented broth.  
 (1) (a) and (b) (2) (a) and (c)  
 (3) (b) and (e) (4) (b) and (c)
28. BOD can be defined as  
 (1) Amount of  $\text{CO}_2$  consumed if all the inorganic matter in one litre of water is oxidised by bacteria.  
 (2) Amount of  $\text{O}_2$  consumed if all the organic matter in one decilitre of water is reduced by bacteria.  
 (3) Amount of  $\text{O}_2$  consumed if all the organic matter in one litre of water is oxidised by bacteria.  
 (4) Amount of  $\text{O}_2$  consumed if all the inorganic matter in one litre of water is oxidised by bacteria.
29. Which one of the following is an example of carrying out biological control of pests/disease using microbes?  
 (1) *Trichoderma* sp. against certain plant pathogens  
 (2) Nucleopolyhedrovirus (NPV) against white rust in Brassica  
 (3) Bt cotton to increase cotton yield.  
 (4) Lady bird beetle against aphids in mustard
30. Match the following:
- |    | Column-I                        |      | Column-II        |
|----|---------------------------------|------|------------------|
| a. | <i>Monascus purpureus</i>       | i.   | Yeast            |
| b. | <i>Trichoderma polysporum</i>   | ii.  | Cheese           |
| c. | <i>Penicillium roqueforti</i>   | iii. | Organ transplant |
| d. | <i>Saccharomyces cerevisiae</i> | iv.  | Biocontrol agent |
| e. | <i>Bacillus thuringiensis</i>   | v.   | Clot bustor      |
- (1) a-v; b-iii; c-ii; d-i; e-iv  
 (2) a-i; b-iii; c-ii; d-i; e-iv  
 (3) a-v; b-iv; c-ii; d-i; e-iii  
 (4) a-iii; b-ii; c-iv; d-i; e-v
31. Pure homozygous offsprings in a dihybrid cross in the  $F_2$  generation will be  
 (1)  $\frac{1}{2}$  (2)  $\frac{1}{4}$  (3)  $\frac{1}{8}$  (4)  $\frac{1}{16}$
32. **Assertion:** Test cross is a back cross.  
**Reason:** In test cross,  $F_1$ -individual is crossed with recessive parents.  
 (1) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.  
 (2) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.  
 (3) If the assertion is true but the reason is false.  
 (4) If both the assertion and reason are false.

33. To prevent curd from getting sour, which parameter should be essentially controlled?  
 (1) Quantity of milk  
 (2) Amount of LAB added initially  
 (3) Temperature of the surrounding  
 (4) Amount of O<sub>2</sub> in surrounding air
34. Treatment of waste water is done by the  
 (1) Photoautotrophic microbes, naturally present in sewage.  
 (2) Chemoautotrophic microbes, naturally present in sewage.  
 (3) Heterotrophic microbes naturally present in sewage.  
 (4) Heterotrophic microbes inoculated in the sewage from outside only.
35. **Assertion:** Biodiversity furthers health.  
**Reason:** As more the sustainability, more the diversity occurs.  
 (1) Assertion and the reason are true and the reason is a correct explanation of the assertion.  
 (2) Assertion and reason are true but the reason is not a correct explanation of the assertion.  
 (3) Assertion is true but the reason is false.  
 (4) Assertion and reason are false.

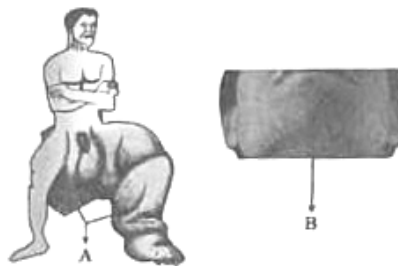
## ZOOLOGY

36. Common cold, Mumps, Chikungunya and Dengue fever are  
 (1) Fungal diseases (2) Bacterial disease  
 (3) Protozoan diseases (4) Viral diseases
37. Which of the following pairs contains an infectious and a non-infectious disease respectively?  
 (1) Typhoid and AIDS  
 (2) AIDS and cancer  
 (3) Pneumonia and malaria  
 (4) Cancer and malaria
38. Match the columns and choose the correct option.

	Column-I		Column-II
(a)	Epidermophyton	(i)	Bacteria
(b)	Wuchereria	(ii)	Worm
(c)	Plasmodium	(iii)	Fungi
(d)	Streptococcus	(iv)	Protozoa

- (1) (a)–(i); (b)–(iv); (c)–(iii); (d)–(ii)  
 (2) (a)–(ii); (b)–(iii); (c)–(iv); (d)–(i)  
 (3) (a)–(iii); (b)–(ii); (c)–(iv); (d)–(i)  
 (4) (a)–(iv); (b)–(iii); (c)–(i); (d)–(ii)

39. Choose the pathogen for these diseases.



- (1) Pathogen for A–Mosquito; Pathogen for B–Fungi  
 (2) Pathogen for A–Protozoa; Pathogen for B–Bacteria  
 (3) Pathogen for A–Bacteria; Pathogen for B–Virus  
 (4) Pathogen for A–Helminth; Pathogen for B–Fungi

40. From the following list, identify the diseases caused by bacteria:  
 (a) Diphtheria (b) Amoebiasis  
 (c) Pneumonia (d) Typhoid  
 (e) Common cold

Choose the correct group of bacterial diseases from the options given below:

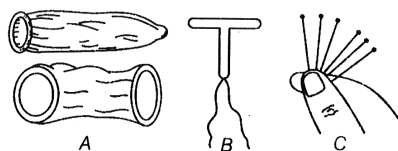
- (1) (a), (b), and (c) only (2) (a), (c), and (d) only  
 (3) (b), (d), and (e) only (4) (c), (d), and (e) only

41. Identify the site where *Wuchereria bancrofti* is normally found on human body?  
 (1) Lymphatic vessels of the lower limb  
 (2) Muscles of the legs  
 (3) Blood vessels of the thigh regions  
 (4) Skin between fingers

42. AIDS is caused by HIV. Among the following, which one is not mode of transmission of HIV?  
 (1) Transfusion of contaminated blood  
 (2) Sharing the infected needles  
 (3) Shaking hands with infected persons  
 (4) Sexual contact with infected persons

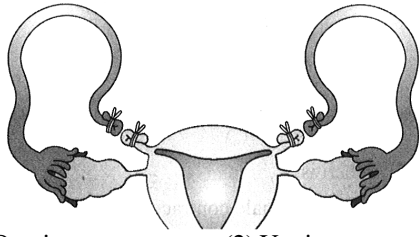
43. "Saheli", a new oral contraceptive for females, was developed by  
 (1) AIIMS, Delhi (2) IICB, Kolkata  
 (3) SGPGI, Lucknow (4) CDRI, Lucknow

44. Choose the correct option from A, B and C.



- (1) A–Condoms, B–Copper-T, C–Implants  
 (2) A–Tubectomy, B–Implants, C–Copper-T  
 (3) A–Vasectomy, B–Condoms, C–Copper-T  
 (4) A–Copper-T, B–Condoms, C–Implants

45. What is the figure given below showing in particular?



- (1) Ovarian cancer      (2) Uterine cancer.  
(3) Tubectomy      (4) Vasectomy

46. Nearly ...A... to ...B... million MTPs are performed in a year all over the world which accounts to ...C... of the total number of conceived pregnancies.

- (1) A-40; B-45; C-1/5<sup>th</sup>  
(2) A-45; B-50; C-1/4<sup>th</sup>  
(3) A-45; B-50; C-1/5<sup>th</sup>  
(4) A-40; B-45; C-1/45<sup>th</sup>

47. When the correction of infertility is not possible in infertility clinics then the couples could be assisted to have children through certain special techniques commonly called as

- (1)RCH    (2)ART    (3)MTP    (4)RTI

48. Difference between ZIFT and IUT lies in the

- (1) methodology      (2) nature of the sperms  
(3) nature of the cells      (4) number of the cells

49. Appearance of dry, scaly lesions on various parts of the body such as skin, nails and scalp are the main symptoms of a fungal disease caused by

- (1) Treponema pallidum  
(2) Plasmodium  
(3) Amoebiasis  
(4) Epidermophyton

50. Which of the following are the reasons for population explosion ?

- (i) Increased health facilities  
(ii) Rapid increase in MMR  
(iii) Rapid increase in IMR  
(iv) Rapid decrease in MMR  
(v) Decrease in number of people reaching reproductive age

- (1) (i) and (iv)      (2) (iii) and (v)  
(3) (ii) and (iv)      (4) (i) and (v)