PHYSICS

SKD TALLENT SEARCH EXAM (SAMPLE PAPER) - CLASS-XII

01. A series L-C-R circuit is operated at resonance. Then
(1) voltage across R is minimum
(2) Impedance is minimum
(3) Impedance is maximum
(4) current amplitude is minimum

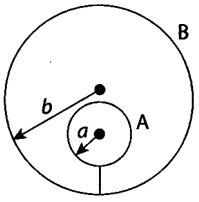
02. In Young's double slit experiment, the ratio of intensities of bright and dark fringes is 9. This means that
(1) the intensities of individual sources are 5 and 4 units respectively
(2) the intensities of individual sources are 4 and 1 units respectively
(3) the ratio of their amplitudes is 3
(4) the ratio of their amplitudes is 4

03. The potential energy of a charged parallel plate capacitor is U_0. If a slab of dielectric constant K is inserted between the plates then the new potential energy will be (assuming charge is constant)

(1) $\frac{U_0}{k}$ (2) U_0k^2

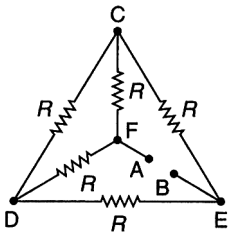
(3) $\frac{U_0}{k^2}$ (4) U_0^2

04. A metal sphere A of radius 5 cm is charged to a potential 2 V. What is its potential if it is enclosed by a spherical conducting shell B of radius 10 cm and the two are connected by a wire.



(1) 1 V (2) 2 V
(3) 4 V (4) Zero

05. Five equal resistances each of resistance R are connected as shown in the figure. A battery of V volts is connected between A and B. The current flowing in AFCEB will be



(1) $\frac{V}{R}$ (2) $\frac{V}{2R}$

(3) $\frac{2V}{R}$ (4) $\frac{3V}{R}$

06. A steady current (i) is flowing through a conductor of uniform cross-section. Any segment of the conductor has
(1) zero charge
(2) only positive charge
(3) only negative charge
(4) charge proportional to current i

07. Two radioactive substances A and B have decay constant 5 λ and λ, respectively. At t = 0 they have the same number of nuclei. The ratio of number of nuclei of A to those of B will be $(1/e)^2$ after a time interval
(1) 4 λ (2) 2 λ
(3) 1/ 2 λ (4) 1/ 4 λ

ROUGH WORK

08. The period of revolution of an electron in the ground state of hydrogen atom is T. The period of revolution of the electron in the first excited state is
(1) 2T (2) 4T
(3) 6T (4) 8T

09. The additional energy that should be given to an electron to reduce its be Broglie wavelength from 1 nm to 0.5 nm is
(1) 2 times the initial kinetic energy
(2) 3 times the initial kinetic energy
(3) 0.5 times the initial kinetic energy
(4) 4 times the initial kinetic energy

10. A dip needle lies initially in the magnetic meridian when it shows an angle of dip θ at a place. The dip circle is rotated through an angle x in the horizontal plane and then it shows an angle of dip θ'. Then

$\frac{\tan\theta'}{\tan\theta}$ is

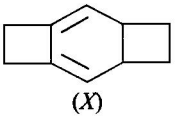
(1) $\frac{1}{\cos x}$ (2) $\frac{1}{\sin x}$

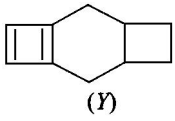
(3) $\frac{1}{\tan x}$ (4) $\cos x$

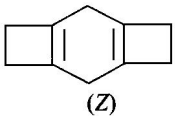
CHEMISTRY

01. Basic properties of TiO_2 ZrO_2 and HfO_2 are in the order :
(1) $TiO_2 < ZrO_2 < HfO_2$
(2) $ZrO_2 < HfO_2 < TiO_2$
(3) $HfO_2 < TiO_2 < ZrO_2$
(4) $TiO_2 < HfO_2 < ZrO_2$

02. Find out correct order for heat of hydrogenation of these compounds:


(X)


(Y)


(Z)

(1) Y > X > Z (2) Y > Z > X
(3) X > Y > Z (4) Z > X > Y

03. Which of the following statements is incorrect about the collision theory of chemical reaction?
(1) It considers reacting molecules or atoms to be hard spheres and ignores their structural features
(2) Number of effective collisions determines the rate of reaction
(3) Collision of atoms or molecules possessing sufficient threshold energy results into the product formation
(4) Molecules should collide with sufficient threshold energy and proper orientation for the collision to be effective

04. An alkyl halide X reacts with sodium in ether mediam to form 3,8-dimethyldecane. What is X?

(1) $CH_3CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2CH_2Cl$

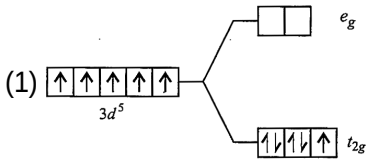
(2) $CH_3CH_2CH_2CH_2Cl$

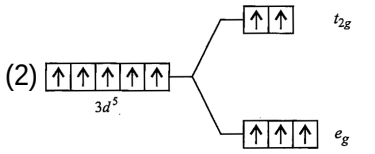
(3) $CH_3-\underset{\displaystyle H}{\underset{|}{\overset{\displaystyle CH_3H}{\overset{|}{C}}}}-\underset{\displaystyle CH_3}{\underset{|}{C}}-CH_2-CH_2-CH_2-CH_2Cl$

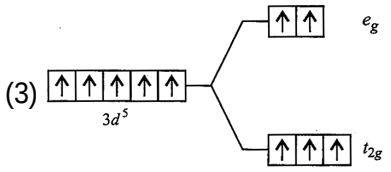
(4) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}-CH_2-CH_2Cl$

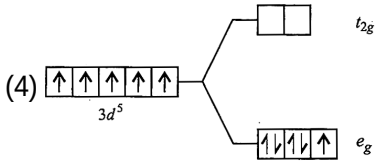
05. Which of the following energy level diagram for $[FeF_6]^{3-}$ is correct on the basis of crystal field theory?

ROUGH WORK

(1) 

(2) 

(3) 

(4) 

06. The EMF of the cell, Ag | AgCl (saturated solution) || Cl^- (c_1 M) | AgCl | Ag is given by

(1) $E_{cell} = -\frac{0.059}{1}\log\sqrt{\frac{K_{SP}}{C_1}}$

(2) $E_{cell} = -\frac{0.059}{1}\log\sqrt{\frac{c_1}{K_{SP}}}$

(3) $E_{cell} = \frac{0.059}{1}\log\frac{\sqrt{K_{SP}}}{c_1}$

(4) $E_{cell} = \frac{0.059}{1}\log\frac{c_1}{\sqrt{K_{SP}}}$

07. Molality of sucrose solution in water so as to get difference of 102.38ºC between boiling point and freezing point of solution

(1) 1 (2) 2
(3) 3 (4) unpredictable

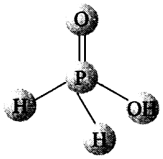
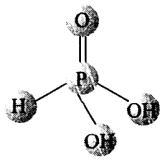
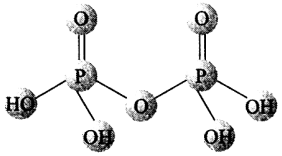
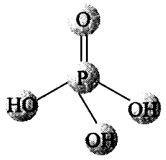
08. In the following sequence of reactions

$CH_3 - Br \xrightarrow{KCN} A \xrightarrow{H_3O^+} B \xrightarrow{LiAlH_4} C$,

the end product C is

(1) Acetone (2) Methane
(3) Acetaldehyde (4) Ethyl alcohol

09. Match the column I with Column II and choose the correct option from the codes given below.

	Column I (Structure of acid)	Column II (Name of acid)
A.		1. Orthophosphorous acid
B.		2. Hypophosphorous acid
C.		3. Orthophosphoric acid
D.		4. Pyrophosphoric acid

(1) A-2, B-1, C-4, D-3 (2) A-4, B-2, C-3, D-1
(3) A-3, B-4, C-1, D-2 (4) A-1, B-3, C-2, D-4

10. Which of the following does not turn Schiff's reagent to pink?

(1) Formaldehyde (2) Propanaldehyde
(3) Acetone (4) Acetaldehyde

ROUGH WORK

Biology

01. Match the column-I & column-II and find the correct combination

Column-I	Column-II
A. Male accessory duct	i. Leydig cell
B. Interstitial cell	ii. Isthmus
C. Funnel shaped structure in female reproductive system	iii. Infundibulum
D. The last part of the oviduct	iv. Rete testes

(1) A-iv, B-ii, C-iii, D-i (2) A-iv, B-i, C-ii, D-iii
(3) A-iv, B-i, C-iii, D-ii (4) A-i, B-iv, C-iii, D-ii

02. Spermatozoans are finally released from the seminiferous tubule by the process called
(1) Spermatogenesis (2) Spermiation
(3) Capacitation (4) Spermicitation

03. Amniocentesis (A banned technique) cannot detects
(1) Down syndrome (2) Haemophilia
(3) Jaundice (4) Sickle cell anemia

04. 'CDRI' is present in which city of India
(1) Pune (2) Lucknow
(3) Ahemdabad (4) Delhi

05. High fever (39° to 40°C), weakness, stomach pain, constipation, headache and loss of appetite are some of the common symptom associated with disease called
(1) Pneumonia (2) Typhoid
(3) Corona (4) Ascariasis

06. The most common infectious disease in man is
(1) Typhoid (2) Malaria
(3) Ringworms (4) Filariasis

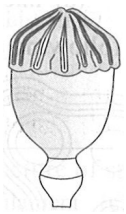
07. Find the incorrect match for bariers of innate immunity?
(1) Physical barrier - Acid in stomach
(2) Physiological barrier - Tear secretion
(3) Cellular barrier - PMNL
(4) Cytokine barrier - Interferon

08. At present (today) we know more than ....(A).... restriction enzymes that have been isolated from over ....(B).... strains of bacteria, each of which recognise different recognition sequence. The correct option for 'A' and 'B' is
(1) A - 800 B - 230 (2) A - 230 B - 900
(3) A - 900 B - 230 (4) A - 230 B - 800

09. A vectorless method suitable for gene transfer in plant is
(1) Microinjection (2) Biolistic
(3) Insertional inactivation (4) T-DNA method

10. A nematode meloidegyne incognita infect the root of tobacco plant and causes a great reduction in yeild. A novel strategy adopted to prevent this infestation is...
(1) Down stream processing
(2) RNA interference
(3) Process of Gene therapy
(4) Genetic Engeneering approval process

11. Identify the type of pistil in the diagram.



(1) Multicarpellary apocarpous
(2) Multicarpellary syncarpous
(3) Multicarpellary pistillate
(4) Monocarpellary apocarpous

12. Match the following columns.

	Column-I		Column-II
A.	Outer integuments	1.	Testa
B.	Inner integuments	2.	Tegman
C.	Ovary	3.	Fruit
D.	Ovules	4.	Seed

(1) A–1; B–3; C–2; D–4 (2) A–3; B–4; C–1; D–2
(3) A–1; B–2; C–3; D–4 (4) A–4; B–3; C–2; D–1

ROUGH WORK

13. Match the following columns.

	Column-I		Column-II
A.	Antipodal	1.	3n
B.	Central cell	2.	2n
C.	MMC	3.	(n + n)
D.	Endosperm	4.	n

(1) A–4; B–3; C–1; D–2 (2) A–3; B–2; C–1; D–4
(3) A–4; B–3; C–2; D–1 (4) A–3; B–4; C–1; D–2

14. Which of the following statement is true for Human Genome project (HGP)?
(1) It was launched in the year 1990 and was called mega project
(2) Total estimated cost of the project would be 9 billion US dollars
(3) It aims to identify all 20000-25000 genes in human DNA
(4) All of the above

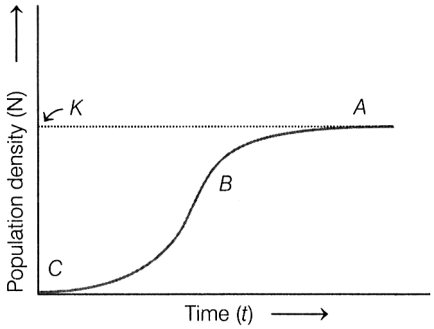
15. The diagram shows an important concept in the genetic implication of DNA. Fill in the blanks A to C.

DNA $\xrightarrow{A}$ mRNA $\xrightarrow{B}$ Protein $\xrightarrow[C]{\text{Proposed by}}$

(1) A–transcription; B–replication; C–James Watson
(2) A–translation; B–transcription; C–Erwin Chargaff
(3) A–transcription; B–translation; C–Francis Crick
(4) A–translation; B–extension; C–Rosalind Franklin

16. Which of the following statements are correct?
I. Wine and beer are produced without distillation of fermented broth.
II. Whisky, brandy and rum are produced by distillation of the fermented broth.
III. Wine and beer are produced by distillation of the fermented broth.
IV. Whisky, brandy and rum are produced without distillation of the fermented broth.
Choose the correct option.
(1) I and II (2) I and III
(3) II and III (4) III and IV

17. Given population growth curve represents the logistic growth curve. In this curve find out what does A, B and C indicates.



(1) A–Lag phase; B–Log phase; C–Stationary phase
(2) A–Log phase; B–Lag phase; C–Stationary phase
(3) A–Stationary phase; B–Log phase; C–Lag phase
(4) A–Stationary phase; B–Lag phase; C–Log phase

18. Lichen is an example of
(1) parasitism (2) predation
(3) commensalism (4) mutualism

19. Ex situ strategies include
I. zoos
II. seed/pollen banks
III. gene bank and tissue cultures
IV. botanical garden
Choose the correct option.
(1) II, III and IV (2) I, II and III
(3) I, II and IV (4) I, II, III and IV

20. In the species area relationship, 'S' represents
(1) species richness (2) slope of the line
(3) specific area (4) special aspecies

ROUGH WORK