

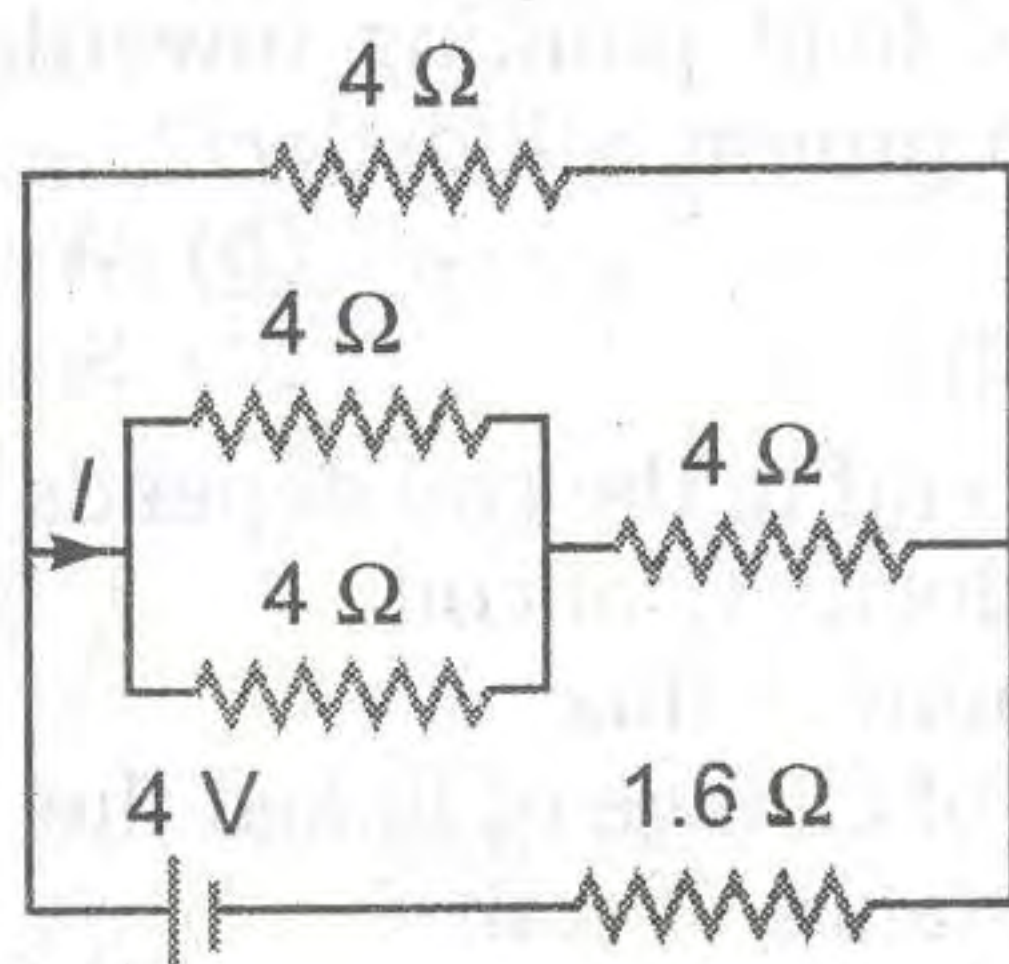
JIPMER

Medical Entrance Exam

Solved Paper 2011

Physics

- The physical quantity having the dimensions $[M^{-1}L^{-3}T^3A^2]$ is
 - resistance
 - resistivity
 - electrical conductivity
 - electromotive force
- In the circuit shown the value of I in ampere is



- 1
 - 0.60
 - 0.4
 - 1.5
- The specific charge of a proton is 9.6×10^7 C/kg. The specific charge of an alpha particle will be
 - 9.6×10^7 C/kg
 - 19.2×10^7 C/kg
 - 4.8×10^7 C/kg
 - 2.4×10^7 C/kg
 - If λ_1 and λ_2 are the wavelengths of the first members of the Lyman and Paschen series respectively, then $\lambda_1 : \lambda_2$ is
 - 1 : 3
 - 1 : 30
 - 7 : 50
 - 7 : 108
 - Activity of a radioactive sample decreases to (1/3)rd of its original value in 3 days. Then, in 9 days its activity will become
 - (1/27) of the original value
 - (1/9) of the original value
 - (1/18) of the original value
 - (1/3) of the original value
 - A tuning fork A produces 4 beats/s with another tuning fork B of frequency 320 Hz. On filing one of the prongs of A, 4 beats/s are again heard when sounded with the same fork B. Then, the frequency of the fork A before filing is
 - 328 Hz
 - 316 Hz
 - 324 Hz
 - 320 Hz

- If there were no gravity, which of the following will not be there for a fluid?
 - Viscosity
 - Surface tension
 - Pressure
 - Archimedes' upward thrust
- A choke is preferred to a resistance for limiting current in AC circuit because
 - choke is cheap
 - there is no wastage of power
 - choke is compact in size
 - choke is a good absorber of heat
- Velocity-time curve for a body projected vertically upwards is
 - parabola
 - ellipse
 - hyperbola
 - straight line
- If r_1 and r_2 are the radii of the atomic nuclei of mass numbers 64 and 125 respectively, then the ratio (r_1/r_2) is
 - $\frac{64}{125}$
 - $\sqrt{\frac{64}{125}}$
 - $\frac{5}{4}$
 - $\frac{4}{5}$
- The ionization energy of Li^{2+} is equal to
 - $9hcR$
 - $6hcR$
 - $2hcR$
 - hcR
- A current of 5 A is passing through a metallic wire of cross-sectional area $4 \times 10^{-6} m^2$. If the density of charge carriers of the wire is $5 \times 10^{26} m^{-3}$, then the drift velocity of the electrons will be
 - 1×10^2 m/s
 - 1.56×10^{-2} m/s
 - 1.56×10^{-3} m/s
 - 1×10^{-2} m/s
- The numerical ratio of displacement to the distance covered is always
 - less than one
 - equal to one
 - equal to or less than one
 - equal to or greater than one
- In Young's double slit experiment with sodium vapour lamp of wavelength 589 nm and the slits 0.589 mm apart, the half angular width of the central maximum is
 - $\sin^{-1}(0.01)$
 - $\sin^{-1}(0.0001)$
 - $\sin^{-1}(0.001)$
 - $\sin^{-1}(0.1)$

15. The principle of LASER action involves
 (a) amplification of particular frequency emitted by the system
 (b) population inversion
 (c) stimulated emission
 (d) All of the above
16. A train is moving towards east and a car is along north, both with same speed. The observed direction of car to the passenger in the train is
 (a) east-north direction
 (b) west-north direction
 (c) south-east direction
 (d) None of the above
17. Which of the following is unipolar transistor?
 (a) $p-n-p$ transistor
 (b) $n-p-n$ transistor
 (c) Field effect transistor
 (d) Point contact transistor
18. A solid sphere and a hollow sphere of the same material and of a same size can be distinguished without weighing
 (a) by determining their moments of inertia about their coaxial axes
 (b) by rolling them simultaneously on an inclined plane
 (c) by rotating them about a common axis of rotation
 (d) by applying equal torque on them
19. Point masses 1, 2, 3 and 4 kg are lying at the points (0, 0, 0), (2, 0, 0), (0, 3, 0) and (-2, -2, 0) respectively. The moment of inertia of this system about X-axis will be
 (a) 43 kg-m^2 (b) 34 kg-m^2
 (c) 27 kg-m^2 (d) 72 kg-m^2
20. The radius of gyration of a body about an axis at a distance 6 cm from its centre of mass is 10 cm. Then, its radius of gyration about a parallel axis through its centre of mass will be
 (a) 80 cm (b) 8 cm
 (c) 0.8 cm (d) 80 m
21. A galvanometer can be changed into an ammeter by using
 (a) low resistance shunt in series
 (b) low resistance shunt in parallel
 (c) high resistance shunt in series
 (d) high resistance shunt in parallel
22. A bullet of mass 20 g and moving with 600 m/s collides with a block of mass 4 kg hanging with the string. What is velocity of bullet when it comes out of block, if block rises to height 0.2 m after collision?
 (a) 200 m/s (b) 150 m/s
 (c) 400 m/s (d) 300 m/s
23. Voltage in the secondary coil of a transformer does not depend upon
 (a) frequency of the source
 (b) voltage in the primary coil
 (c) ratio of number of turns in the two coils
 (d) Both (b) and (c)
24. In Carnot engine efficiency is 40% at hot reservoir temperature T . For efficiency 50%, what will be temperature of hot reservoir?
 (a) $\frac{T}{5}$ (b) $\frac{2T}{5}$
 (c) $6T$ (d) $\frac{6T}{5}$
25. A ball of mass 2 kg moving with velocity 3 m/s, collides with spring of natural length 2 m and force constant 144 N/m. What will be length of compressed spring?
 (a) 2 m (b) 1.5 m
 (c) 1 m (d) 0.5 m
26. A proton moving vertically downward enters a magnetic field pointing towards north. In which direction proton will deflect?
 (a) East (b) West
 (c) North (d) South
27. Induced emf in the coil depends upon
 (a) conductivity of coil
 (b) amount of flux
 (c) rate of change of linked flux
 (d) resistance of coil
28. X-rays are used in determining the molecular structure of crystalline because
 (a) its energy is high
 (b) it can penetrate the material
 (c) its wavelength is comparable to interatomic distance
 (d) its frequency is low
29. Light of frequency ν falls on material of threshold frequency ν_0 . Maximum kinetic energy of emitted electron is proportional to
 (a) $\nu - \nu_0$ (b) ν
 (c) $\sqrt{\nu - \nu_0}$ (d) ν_0
30. A light moves from denser to rarer medium, which of the following is correct?
 (a) Energy increases
 (b) Frequency increases
 (c) Phase changes by 90°
 (d) Velocity increases
31. Which one of the following statements is true?
 (a) Both light and sound waves in air are transverse
 (b) The sound waves in air are longitudinal while the light waves are transverse
 (c) Both light and sound waves in air are longitudinal
 (d) Both light and sound waves can travel in vacuum

32. A metro train starts from rest and in 5 s achieves 108 km/h. After that it moves with constant velocity and comes to rest after travelling 45 m with uniform retardation. If total distance travelled is 395 m, find total time of travelling.
 (a) 12.2 s (b) 15.3 s
 (c) 9 s (d) 17.2 s
33. A closed organ pipe of length 20 cm is sounded with tuning fork in resonance. What is frequency of tuning fork? ($v = 332$ m/s)
 (a) 300 Hz (b) 350 Hz
 (c) 375 Hz (d) 415 Hz
34. The temperature of the sun can be found out by using
 (a) Wien's displacement law
 (b) Kepler's law of motion
 (c) Stefan's Boltzmann law
 (d) Planck's law
35. Pressure of an ideal gas is increased by keeping temperature constant. What is effect on kinetic energy of molecules?
 (a) Increase
 (b) Decrease
 (c) No change
 (d) Cannot be determined
36. Kirchhoff's law of junction, $\Sigma I = 0$, is based on
 (a) conservation of energy
 (b) conservation of charge
 (c) conservation of energy as well as charge
 (d) conservation of momentum
37. A transverse wave is expressed as,

$$y = y_0 \sin 2\pi ft$$
 For what value of λ , maximum particle velocity equals to 4 times the wave velocity?
 (a) $y_0 \frac{\pi}{2}$ (b) $2y_0 \pi$ (c) $y_0 \pi$ (d) $y_0 \frac{\pi}{4}$
38. For a given lens, the magnification was found to be twice as large as when the object was 0.15 m distant from it as when the distance was 0.2 m. The focal length of the lens is
 (a) 1.5 m (b) 0.20 m
 (c) 0.10 m (d) 0.05 m
39. When sound waves travel from air to water which one of the following remains constant?
 (a) Time period (b) Frequency
 (c) Velocity (d) Wavelength
40. The Bulk modulus for an incompressible liquid is
 (a) zero (b) unity
 (c) infinity (d) between 0 and 1

Chemistry

1. 10^{-6} M NaOH is diluted 100 times. The pH of the diluted base is
 (a) between 7 and 8
 (b) between 5 and 6
 (c) between 6 and 7
 (d) between 10 and 11
2. An sp^3 -hybrid orbital contains
 (a) $\frac{1}{4}$ s-character (b) $\frac{1}{2}$ s-character
 (c) $\frac{2}{3}$ s-character (d) $\frac{3}{4}$ s-character
3. Leaching is a process of
 (a) reduction (b) concentration
 (c) refining (d) oxidation
4. Electrolysis of fused NaCl will give
 (a) Na (b) NaOH
 (c) NaClO (d) NaClO₃
5. Which of the following fluorides does not exist?
 (a) NF₅ (b) PF₅
 (c) AsF₅ (d) SbF₅
6. Red lead is
 (a) PbO (b) PbO₂
 (c) Pb₃O₄ (d) Pb₂O₃
7. Hybridisation states of C in CH₃⁺ and CH₃⁻ are
 (a) sp^2, sp^3 (b) sp^3, sp^2
 (c) sp, sp^2 (d) sp^2, sp
8. Which one of the following complexes is outer orbital complex?
 (a) [Co(NH₃)₆]³⁺ (b) [Mn(CN)₆]⁴⁻
 (c) [Fe(CN)₆]⁴⁻ (d) [Ni(NH₃)₆]²⁺
9. A solution made by dissolving 40 g NaOH in 1000 g of H₂O is
 (a) 1 molar (b) 1 normal
 (c) 1 molal (d) None of these
10. 0.1 mol HCl is equal to
 (a) 3.65 g (b) 36.5 g
 (c) 18 g (d) 1.8 g
11. Which will liberate bromine from a solution of potassium bromide?
 (a) I₂ (b) Cl₂ (c) SO₂ (d) HI
12. Which of the following has the maximum number of unpaired electrons?
 (a) V³⁺ (b) Fe²⁺
 (c) Mn²⁺ (d) Cu⁺
13. The geometry of XeF₆ is
 (a) planar hexagon (b) regular octahedron
 (c) distorted octahedron (d) square bipyramid
14. The correct statement with regard to H₂⁺ and H₂⁻ is
 (a) both H₂⁺ and H₂⁻ are equally stable
 (b) both H₂⁺ and H₂⁻ do not exist
 (c) H₂⁻ is more stable than H₂⁺
 (d) H₂⁺ is more stable than H₂⁻

15. 2 g of a radioactive sample having half-life of 15 days was synthesised on 1st Jan 2009. The amount of the sample left behind on 1st March, 2009 (including both the days) is
 (a) 0 g (b) 0.125 g
 (c) 1 g (d) 0.5 g
16. The rate equation for a reaction,

$$A \longrightarrow B$$
 is $r = k[A]^0$. If the initial concentration of the reactant is $a \text{ mol dm}^{-3}$, the half-life period of the reaction is
 (a) $\frac{a}{2k}$ (b) $\frac{k}{a}$
 (c) $\frac{a}{k}$ (d) $\frac{2a}{k}$
17. For the reaction,

$$\text{H}_2\text{O}(l) \rightleftharpoons \text{H}_2\text{O}(g)$$
 at 373 K and 1 atm pressure
 (a) $\Delta H = 0$ (b) $\Delta E = 0$
 (c) $\Delta H = T\Delta S$ (d) $\Delta H = \Delta E$
18. In electrophilic aromatic substitution reaction, the nitro group is *meta* directing because it
 (a) decreases electron density at *ortho* and *para* positions
 (b) decreases electron density at *meta* position
 (c) increases electron density at *meta* position
 (d) increases electron density at *ortho* and *para* positions
19. The best method for the conversion of an alcohol into an alkyl chloride is by treating the alcohol with
 (a) PCl_3
 (b) PCl_5
 (c) SOCl_2 in presence of pyridine
 (d) dry HCl in the presence of anhydrous ZnCl_2
20. The compound which is not formed during the dry distillation of a mixture of calcium formate and calcium acetate is
 (a) methanal (b) propanal
 (c) propanone (d) ethanal
21. The compound which forms acetaldehyde when heated with dilute NaOH, is
 (a) 1,1-dichloroethane
 (b) 1,1,1-trichloroethane
 (c) 1-chloroethane
 (d) 1,2-dichloroethane
22. The one which has least iodine value is
 (a) sunflower oil (b) ginger oil
 (c) ghee (d) groundnut oil
23. IUPAC name of $(\text{CH}_3)_3\text{CCl}$ is
 (a) *n*-butyl chloride
 (b) 3-chloro butane
 (c) 2-chloro-2-methylpropane
 (d) *t*-butyl chloride
24. The condensation polymer among the following is
 (a) rubber (b) protein
 (c) PVC (d) polyethene
25. In which of the following, NH_3 is not used?
 (a) Tollen's reagent
 (b) Nessler's reagent
 (c) Group reagent for the analysis of IV group basic radicals
 (d) Group reagent for the analysis of III group basic radicals
26. Argon is used
 (a) in filling airships
 (b) to obtain low temperature
 (c) in high temperature welding
 (d) in radiotherapy for treatment of cancer
27. Hyperconjugation is most useful for stabilising which of the following carbocations?
 (a) *Neo*-pentyl (b) *Tert*-butyl
 (c) *Iso*-propyl (d) Ethyl
28. The isomerism that arises due to restricted bond rotation is
 (a) metamerism
 (b) optical isomerism
 (c) position isomerism
 (d) geometrical isomerism
29. Amine that cannot be prepared by Gabriel phthalimide synthesis is
 (a) aniline (b) benzylamine
 (c) methylamine (d) *iso*-butylamine
30. Lactose is made of
 (a) α -D-glucose only
 (b) α -D-glucose and β -D-glucose
 (c) α -D-galactose and β -D-glucose
 (d) β -D-galactose and β -D-glucose
31. Cetyltrimethyl ammonium bromide is a popular
 (a) anionic detergent
 (b) cationic detergent
 (c) non-ionic detergent
 (d) sweetener
32. The number of electrons, neutrons and protons in a species are equal to 10, 8 and 8 respectively. The proper symbol of the species is
 (a) $^{16}_8\text{O}$ (b) $^{18}_8\text{O}$
 (c) $^{18}_{10}\text{Ne}$ (d) $^{16}_8\text{O}^{2-}$
33. 56 g of nitrogen and 96 g of oxygen are mixed isothermally and at a total pressure of 10 atm. The partial pressures of oxygen and nitrogen (in atm) are respectively
 (a) 4, 6 (b) 5, 5
 (c) 2, 8 (d) 6, 4
34. Which of the following undergoes reduction with hydrogen peroxide in alkaline medium?
 (a) Mn^{2+} (b) I_2
 (c) PbS (d) Fe^{2+}

35. The metal that produces red-violet colour in the non-luminous flame is
 (a) Ba (b) Ag
 (c) Rb (d) Pb
36. According to the first law of thermodynamics which of the following quantities represents the change in a state function?
 (a) q_{rev} (b) $q_{rev} - W_{rev}$
 (c) $\frac{q_{rev}}{W_{rev}}$ (d) $q_{rev} + W_{rev}$
37. The maximum oxidation state exhibited by actinide ions is
 (a) +5 (b) +4
 (c) +7 (d) +8
38. The dispersed phase and dispersion medium in soap lather are respectively
 (a) gas and liquid (b) liquid and gas
 (c) solid and gas (d) solid and liquid
39. The expression for the solubility product of Ag_2CO_3 will be
 (a) $K_{sp} = s^2$ (b) $K_{sp} = 4s^3$
 (c) $K_{sp} = 27s^4$ (d) $K_{sp} = s$
40. A 600 W mercury lamp emits monochromatic radiation of wavelength 331.3 nm. How many photons are emitted from the lamp per second? ($h = 6.626 \times 10^{-34}$ J-s; velocity of light = 3×10^8 ms⁻¹)
 (a) 1×10^{19} (b) 1×10^{20} (c) 1×10^{21} (d) 1×10^{23}

Zoology

1. In mammals, histamine is secreted by
 (a) fibroblasts (b) histocytes
 (c) lymphocytes (d) mast cells
2. The layer of cells that secrete enamel of tooth is
 (a) dentoblast (b) ameloblast
 (c) osteoblast (d) odontoblast
3. Which important green house gas, other than carbon dioxide, is being produced from the agricultural fields?
 (a) Arsine (b) Sulphur dioxide
 (c) Ammonia (d) Nitrous oxide
4. The exchange of gases in the alveoli of the lungs takes place by
 (a) osmosis (b) simple diffusion
 (c) passive transport (d) active transport
5. Carbon monoxide is a pollutant because it
 (a) reacts with oxygen
 (b) inhibits glycolysis
 (c) reacts with haemoglobin
 (d) makes nervous system inactive
6. Total number of bones in the hindlimb of a man is
 (a) 14 (b) 21
 (c) 24 (d) 30
7. Calcitonin is a thyroid hormone which
 (a) elevates potassium level in blood
 (b) lowers calcium level in blood
 (c) elevates calcium level in blood
 (d) has no effect on calcium
8. A condition of failure of kidney to form urine is called
 (a) deamination (b) entropy
 (c) anuria (d) None of these
9. Solenocytes are the main excretory structures in
 (a) annelids (b) molluscs
 (c) echinoderms (d) platyhelminthes
10. A woman with two genes (one on each X-chromosome) for haemophilia and one gene for colour blindness on the X-chromosome marries a normal man. How will the progeny be?
 (a) All sons and daughters are haemophilic and colourblind
 (b) Haemophilic and colourblind daughters
 (c) 50% haemophilic colourblind sons and 50% haemophilic sons
 (d) 50% haemophilic daughters and 50% colourblind daughters
11. The functional unit of contractile system in striated muscle is
 (a) cross bridge (b) myofibril
 (c) sarcomere (d) Z-band
12. The contraction of gall bladder is due to
 (a) gastrin (b) secretin
 (c) cholecystokinin (d) enterogastrone
13. The diversity in the type of beaks of finches adapted to different feeding habits on the Galapagos islands, as observed by Darwin, provides evidence for
 (a) origin of species by natural selection
 (b) intraspecific variations
 (c) intraspecific competition
 (d) interspecific competition
14. The most important component of the oral contraceptive pills is
 (a) progesterone
 (b) growth hormone
 (c) thyroxine
 (d) luteinising hormone
15. Sympathetic nervous system induces
 (a) heart beat
 (b) secretion of digestive juice
 (c) secretion of saliva
 (d) All of the above

16. The middle piece of the sperm contains
 - (a) proteins
 - (b) centriole
 - (c) nucleus
 - (d) mitochondria
17. The term 'aquaculture' means
 - (a) aspergillosis
 - (b) inland fisheries
 - (c) marine fisheries
 - (d) Both (b) and (c)
18. Active immunity means
 - (a) resistance developed after disease
 - (b) increasing quantity of blood
 - (c) resistance developed before disease
 - (d) increasing rate of heart-beat
19. The canal system is a characteristic feature of
 - (a) echinoderms
 - (b) helminthes
 - (c) coelenterates
 - (d) sponges
20. Which cranial nerve has the highest number of branches?
 - (a) Facial nerve
 - (b) Trigeminal
 - (c) Vagus nerve
 - (d) None of these
21. The problem due to Rh⁻ factor arises when the blood of two (Rh⁺ and Rh⁻) mixup
 - (a) during pregnancy
 - (b) through transfusion
 - (c) in a test tube
 - (d) Both (a) and (b)
22. Which of the following is mismatched?
 - (a) Vitamin-K — Beri-beri
 - (b) Vitamin-D — Rickets
 - (c) Vitamin-C — Scurvy
 - (d) Vitamin-A — Xerophthalmia
23. The joint between atlas and axis is called
 - (a) pivot joint
 - (b) hinge joint
 - (c) saddle joint
 - (d) angular joint
24. The blood group with antibody-a and antibody-b is
 - (a) B
 - (b) A
 - (c) O
 - (d) AB
25. Rate of heart beat is determined by
 - (a) Purkinje fibres
 - (b) papillary muscles
 - (c) SA-node
 - (d) AV-node
26. The junction between the axon of one neuron and the dendrite of the next is called
 - (a) junction point
 - (b) a synapse
 - (c) a joint
 - (d) constant bridge
27. Chondrichthyes is characterised by
 - (a) placoid scale
 - (b) ventral mouth
 - (c) ctenoid scale and ventral mouth
 - (d) placoid scale and ventral mouth
28. Secondary body cavity with segmented mesodermal lining is called
 - (a) haemocoel
 - (b) neurocoel
 - (c) true coelom
 - (d) pseudocoelom
29. Stratified epithelium is found in
 - (a) seminiferous tubule
 - (b) fallopian tube
 - (c) nasal cavity
 - (d) kidney tubules
30. Dead space air in man is
 - (a) 500 mL
 - (b) 150 mL
 - (c) 250 mL
 - (d) 1.5 L
31. Vertebrate brain differentiates from
 - (a) endoderm
 - (b) mesoderm
 - (c) ectoderm
 - (d) blastoderm
32. Animals of class-Mammalia have
 - (a) seven cervical vertebrae
 - (b) seven cranial nerve
 - (c) single ventricular chamber
 - (d) fourteen cervical vertebrae
33. Vaccine for tuberculosis is known as
 - (a) PAS vaccine
 - (b) BCG vaccine
 - (c) OPV
 - (d) DPT
34. Sir Godfrey Hounsfield developed the diagnostic technique of
 - (a) CT scanning
 - (b) MRI
 - (c) endoscopy
 - (d) bronchoscopy
35. Alcoholism may leads to
 - (a) skin cancer
 - (b) liver cirrhosis
 - (c) viral disease
 - (d) eye infections
36. The basic unit of classification is
 - (a) species
 - (b) genus
 - (c) family
 - (d) phylum
37. Age of fishes is also known as
 - (a) Permian Era
 - (b) Silurian Era
 - (c) Devonian Era
 - (d) Ordovician Era
38. A hereditary disease which is never passed on from father to son is
 - (a) X-chromosomal linked disease
 - (b) Autosomal linked disease
 - (c) Y-chromosomal linked disease
 - (d) None of the above
39. One animal that does not perform locomotion is
 - (a) Sycon
 - (b) Nereis
 - (c) Sepia
 - (d) Euglena
40. Amount of CO₂ in expired air is about
 - (a) 0.04%
 - (b) 0.03%
 - (c) 4.5%
 - (d) 21%

Botany

- The codon for anticodon 3'-UUUA-5' is
 - 3'-AAU-5'
 - 5'-UAAA-3'
 - 5'-AAAU-3'
 - 3'-UAAU-5'
- A kind of biotechnology involving manipulation of DNA is
 - DNA replication
 - genetic engineering
 - denaturation
 - renaturation
- Minamata disease is caused due to presence of in water.
 - cadmium
 - lead
 - arsenic
 - mercury
- The phrase '*Omnis cellula e cellula*' was given by
 - Virchow
 - Pasteur
 - Schleiden
 - Brown
- Intermediate community between pioneer and climax communities is called
 - seral community
 - biotic community
 - temporary community
 - ecosere
- Ten percent law of energy transfer in a food chain is given by
 - Schimper
 - Elton
 - Haeckel
 - Lindemann
- Apoenzyme is
 - protein
 - carbohydrate
 - vitamin
 - amino acid
- Glycogenolysis involves
 - conversion of sugar into glycogen
 - oxidation of sugar
 - conversion of glycogen into sugar
 - conversion of glycogen into fat
- A polygenic inheritance in human beings is
 - skin colour
 - sickle cell anaemia
 - colour blindness
 - phenylketonuria
- Nucleic acid segment tagged with a radioactive molecule is called
 - clone
 - probe
 - plasmid
 - vector
- Powdery mildew of wheat is caused by a species of
 - Puccinia*
 - Erysiphe*
 - Ustilago*
 - Albugo*
- Nucleic acid is absent in
 - virus
 - viroid
 - prion
 - mycoplasma
- In most fungi, cell wall is chiefly made of
 - cellulose
 - chitin
 - protein
 - lipid
- Heterocysts are present in
 - Riccia*
 - Ulothrix*
 - Albugo*
 - Nostoc*
- Double fertilization occurs in
 - Riccia*
 - Pteridium*
 - Cycas*
 - Capsella*
- In *Ruscus*, the stem is a
 - phyllode
 - cladode
 - offset
 - sucker
- Catkin inflorescence is found in
 - wheat
 - oat
 - mulberry
 - fig
- Epigynous flowers are present in
 - mustard
 - brinjal
 - China rose
 - cucumber
- In *Dianthus*, placentation is
 - basal
 - free central
 - axile
 - marginal
- The term 'keel' is used for special type of
 - sepals
 - petals
 - stamens
 - carpels
- Coffee and quinine are obtained from the
 - Leguminosae
 - Asteraceae
 - Rubiaceae
 - Poaceae
- Kranz anatomy can be observed in leaves of
 - sorghum
 - spinach
 - mustard
 - tulip
- The term 'bark' refers to
 - phellem, phelloderm and vascular cambium
 - periderm and secondary xylem
 - cork cambium and cork
 - phellogen, phellem, phelloderm and secondary phloem
- Light reaction in stroma lamellae of the chloroplast results in the formation of
 - NADPH₂
 - ATP + NADPH₂
 - ATP
 - O₂
- In leaves of C₄ plants malic acid synthesis during CO₂ fixation occurs in
 - bundle sheath
 - mesophyll
 - epidermis
 - guard cells
- Membrane is absent in
 - nucleus
 - nucleolus
 - vacuole
 - lysosome

27. The quiescent centre in root meristem serves as a
 (a) site for storage of food, which is utilised during maturation
 (b) reservoir of growth hormones
 (c) reserve for replenishment of damaged cells of the meristem
 (d) region for absorption of water
28. An example of competitive inhibition of an enzyme is the inhibition of
 (a) succinic dehydrogenase by malonic acid
 (b) cytochrome oxidase by cyanide
 (c) hexokinase by glucose-6-phosphate
 (d) carbonic anhydrase by carbon dioxide
29. Biological Oxygen Demand (BOD) is a measure of
 (a) industrial wastes poured into water bodies
 (b) extent to which water is polluted with organic compound
 (c) amount of carbon monoxide inseparably combined with haemoglobin
 (d) amount of oxygen needed by green plants during night
30. In prokaryotes, chromatophores are
 (a) specialised granules responsible for colouration of cells
 (b) structures responsible for organising the shape of the organism
 (c) inclusion bodies lying free inside the cells for carrying out various metabolic activities
 (d) internal membrane systems that may become extensive and complex in photosynthetic bacteria
31. The Montreal Protocol refers to
 (a) persistent organic pollutants
 (b) global warming and climate change
 (c) substances that deplete the ozone layer
 (d) biosafety of genetically modified organisms
32. In the sieve elements, which one of the following is the most likely function of P-proteins?
 (a) Deposition of callose on sieve plates
 (b) Providing energy for active translocation
 (c) Autolytic enzymes
 (d) Sealing off mechanism on wounding
33. Which one of the following precedes re-formation of the nuclear envelope during M-phase of the cell cycle?
 (a) Decondensation from chromosome and reassembly of the nuclear lamina
 (b) Transcription from chromosome and reassembly of the nuclear lamina
 (c) Formation of the contractile ring and formation of the phragmoplast
 (d) Formation of the contractile ring and transcription from chromosomes
34. Viruses that infect bacterium and cause their lysis, are called
 (a) lysozymes
 (b) lipolytic
 (c) lytic
 (d) lysogenic
35. A plant requires magnesium (Mg) for
 (a) holding cells together
 (b) protein synthesis
 (c) chlorophyll synthesis
 (d) cell wall development
36. Which one of the following pairs, is not correctly matched?
 (a) Abscisic acid — Stomatal closure
 (b) Gibberellic acid — Leaf fall
 (c) Cytokinin — Cell division
 (d) IAA — Cell wall elongation
37. Two cells A and B are contiguous. Cell A has osmotic pressure 10 atm, turgor pressure-7 atm and diffusion pressure deficit 3 atm. Cell B has osmotic pressure 8 atm, turgor pressure 3 atm and diffusion pressure deficit 5 atm. The result will be
 (a) movement of water from cell B to A
 (b) no movement of water
 (c) equilibrium between the two
 (d) movement of water from cell A to B
38. The Okazaki fragments in DNA chain growth
 (a) results in transcription
 (b) polymerise in the 3' to 5' direction and forms replication fork
 (c) prove semi-conservative nature of DNA replication
 (d) polymerise in the 5' to 3' direction and explain 3' to 5' DNA replication
39. One gene-one enzyme relationship was established for the first time in
 (a) *Neurospora crassa*
 (b) *Salmonella typhimurium*
 (c) *Escherichia coli*
 (d) *Diplococcus pneumoniae*
40. In gymnosperms, the pollen chamber represents
 (a) a cell in the pollen grain in which the sperms are formed
 (b) a cavity in the ovule in which pollen grains are stored after pollination
 (c) an opening in the megagametophyte through which the pollen tube approaches the egg
 (d) the microsporangium in which pollen grains develop

General English

Directions (Q. Nos. 1 to 5) Four alternatives are given for the underlined idiom/phrase. Choose the alternative which best expresses the meaning of the underlined idiom/phrase.

- The principal has to carry out the orders issued by the higher authorities.
 (a) obey (b) communicate
 (c) execute (d) modify
- The young engineer was hauled up for spilling the beans about the new project to the competitor.
 (a) suppressing the information
 (b) hiding the details
 (c) revealing the information indiscreetly
 (d) spoiling the plans
- The Government claims that Indian industry is progressing by leaps and bounds.
 (a) intermittently
 (b) leisurely
 (c) at a rapid pace
 (d) at a desired pace
- Laying off of thousands of workers is inevitable under the new economic policy.
 (a) Dismissal from jobs of
 (b) Offering new jobs to
 (c) Reduction of worker's wages of
 (d) Sending on leave
- "I take thee at thy word", said Romeo to Juliet.
 (a) Listen to you carefully
 (b) Do not believe you
 (c) Feel angry with you
 (d) Truly believe you

Directions (Q. Nos. 6 to 10) Out of the four alternatives, choose the one which can be substituted for the given words/sentence.

- To be biased against
 (a) partial (b) objective
 (c) prejudiced (d) predestined
- Motion of head, hand etc, as a mode of expression indicating attitude
 (a) Gesture (b) Grin
 (c) Gestation (d) Grimace
- Bitter and violent attack in words
 (a) Diaspora (b) Diacriticism
 (c) Diadem (d) Diatribe
- Treatment by means of exercise and massage
 (a) Chemotherapy
 (b) Hydrotherapy
 (c) Physiotherapy
 (d) Psychotherapy
- The abandonment of one's country or cause
 (a) Defection (b) Disloyalty
 (c) Desertion (d) Migration

Directions (Q. Nos. 11 to 12) A part of the sentence is underlined. Below are given alternatives to the underlined parts at (a), (b) and (c) which may improve the sentence. Choose the correct alternative. In case no improvement is needed, your answer is (d).

- He declined all the allegations against him.
 (a) spurned (b) refused
 (c) refuted (d) no improvement
- It is time we leave.
 (a) left (b) have to leave
 (c) would leave (d) no improvement
- We spent an hour discussing about his character.
 (a) on his character (b) of his character
 (c) his character (d) no improvement
- Afer the letter reached me, I shall know the result.
 (a) After the letter reaches
 (b) After the letter will reach
 (c) After the letter has reached
 (d) No improvement
- I have returned library books yesterday.
 (a) had returned
 (b) have had returned
 (c) returned
 (d) no improvement

Directions (Q. Nos. 16 to 20) The first and the last parts of the sentence are numbered 1 to 6, the rest of the sentence is split into four parts and named P, Q, R and S. These four parts are not given in their proper order. Read the parts and find out which of the four combinations is correct.

1. Early to bed, early to rise, makes a man healthy, wealthy and wise.
 P. But for the morning tea, I had to wait for someone to get up before me.
 Q. This saying inspired me to rise early.
 R. That day I was the first to get up.
 S. One day I got up early in the morning.
 6. Then I realised that it was a waste of time to get up early and wait for the morning tea.
 (a) Q S R P (b) Q P R S
 (c) P Q R S (d) S P Q R
1. A wood-cutter was cutting a tree on a river bank.
 P. He knelt down and prayed.
 Q. His axe slipped and fell into the water.
 R. God Mercury appeared before him and asked about the matter.
 S. He could not get it back as the river was very deep.
 6. He dived into the water and came up with an axe of gold.
 (a) R P Q S (b) R P S Q
 (c) Q S R P (d) Q S P R

18. 1. A dog stole a piece of meat from a butcher's shop.
 P. He barked in anger.
 Q. He ran to the jungle with the piece of meat.
 R. He saw his reflection.
 S. He crossed a river on the way.
 6. He lost his piece of meat.
 (a) Q P S R (b) Q S R P
 (c) Q P R S (d) S R P Q

19. 1. Ramai and Samai were two poor young men.
 P. On market day they sold their labour.
 Q. They lived near Mahespu.
 R. On other days, they remained in the village looking for work.
 S. They wanted regular work.
 6. The headman gave them two plots.
 (a) Q P R S (b) R P Q S
 (c) S P Q R (d) P Q R S

20. 1. Roger wanted to become a doctor.
 P. He put away enough money to pay his first year fees.
 Q. They could not afford the fees.
 R. Undaunted, he got himself a job in the dockyard.
 S. However, he came from a poor family.
 6. Once enrolled, he was recognised as a gifted student, and scholarships took care of the rest of his studies.
 (a) S R P Q (b) P R S Q
 (c) S Q R P (d) Q R S P

Directions (Q. Nos. 21 to 25) *Out of the four alternatives, choose the one which expresses the right meaning of the given word.*

21. Dubious
 (a) Doubtful (b) Disputable
 (c) Duplicate (d) Dangerous
22. Flabbergasted
 (a) Scared (b) Embarrassed
 (c) Dumbfounded (d) Humiliated
23. Eternal
 (a) Innumerable (b) Unmeasurable
 (c) Prolonged (d) Perpetual
24. Genuine
 (a) Authentic (b) Legitimate
 (c) Reliable (d) Pure
25. Obscene
 (a) Indecent (b) Incorrigible
 (c) Ridiculous (d) Intolerable

Directions (Q. Nos. 26 to 30) *Choose the word opposite in meaning to the given word.*

26. Despair
 (a) Belief (b) Trust
 (c) Hope (d) Faith

27. In toto
 (a) Bluntly (b) Partially
 (c) Entirely (d) Strongly
28. Protean
 (a) Amateur (b) Catholic
 (c) Unchanging (d) Rapid
29. Predilection
 (a) Acceptance (b) Attraction
 (c) Dislike (d) Choice
30. Admonish
 (a) Condemn (b) Bless
 (c) Praise (d) Congratulate

Directions (Q. Nos. 31 to 35) *Sentences are given with blanks to be filled in with an appropriate and suitable word. Four alternatives are suggested for each question. Choose the correct alternative out of the four.*

31. Are you really desirous visiting Japan?
 (a) of (b) in
 (c) to (d) about
32. When Indians from the South move North, they find certain aspects of life quite from their own.
 (a) strange (b) separate
 (c) different (d) divergent
33. The sky is overcast, we the storm will soon burst.
 (a) expect (b) hope
 (c) trust (d) suspect
34. Population increase with depletion of foreign reserves has led to great daily hardships.
 (a) joined (b) mixed
 (c) added (d) coupled
35. The National Anthem is at every official function.
 (a) uttered (b) sung
 (c) whispered (d) chanted

Directions (Q. Nos. 36 to 40) *Four words are given in each question, out of which only one word is wrongly spelt. Find the wrongly spelt word and indicate it in the answer sheet by blackening the appropriate rectangle.*

36. (a) Accomplice (b) Accompaniment
 (c) Accomplishment (d) Accomodation
37. (a) Replaceable (b) Replaceing
 (c) Replacement (d) Replaced
38. (a) Relieve (b) Protein
 (c) Deceit (d) Frieght
39. (a) Labrinth (b) Laboratory
 (c) Laborious (d) Library
40. (a) Comit (b) Comedian
 (c) Committee (d) Comunication

Answers

Physics

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|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (c) | 2. (c) | 3. (c) | 4. (d) | 5. (a) | 6. (d) | 7. (d) | 8. (b) | 9. (d) | 10. (d) |
| 11. (a) | 12. (b) | 13. (c) | 14. (c) | 15. (d) | 16. (b) | 17. (c) | 18. (b) | 19. (a) | 20. (b) |
| 21. (b) | 22. (a) | 23. (a) | 24. (d) | 25. (b) | 26. (a) | 27. (c) | 28. (c) | 29. (a) | 30. (c) |
| 31. (b) | 32. (d) | 33. (d) | 34. (c) | 35. (c) | 36. (b) | 37. (a) | 38. (b) | 39. (b) | 40. (c) |

Chemistry

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|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (a) | 2. (a) | 3. (b) | 4. (a) | 5. (a) | 6. (c) | 7. (a) | 8. (d) | 9. (c) | 10. (a) |
| 11. (b) | 12. (c) | 13. (c) | 14. (d) | 15. (b) | 16. (a) | 17. (c) | 18. (a) | 19. (c) | 20. (b) |
| 21. (a) | 22. (c) | 23. (c) | 24. (b) | 25. (b) | 26. (c) | 27. (b) | 28. (d) | 29. (a) | 30. (d) |
| 31. (b) | 32. (d) | 33. (d) | 34. (b) | 35. (c) | 36. (d) | 37. (c) | 38. (a) | 39. (b) | 40. (c) |

Zoology

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|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (d) | 2. (d) | 3. (d) | 4. (b) | 5. (c) | 6. (d) | 7. (b) | 8. (c) | 9. (d) | 10. (c) |
| 11. (c) | 12. (c) | 13. (a) | 14. (a) | 15. (a) | 16. (d) | 17. (d) | 18. (a) | 19. (d) | 20. (c) |
| 21. (d) | 22. (a) | 23. (a) | 24. (c) | 25. (c) | 26. (b) | 27. (d) | 28. (c) | 29. (c) | 30. (b) |
| 31. (c) | 32. (a) | 33. (b) | 34. (a) | 35. (b) | 36. (a) | 37. (c) | 38. (a) | 39. (a) | 40. (c) |

Botany

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|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (c) | 2. (b) | 3. (d) | 4. (a) | 5. (a) | 6. (d) | 7. (a) | 8. (c) | 9. (a) | 10. (b) |
| 11. (b) | 12. (c) | 13. (b) | 14. (d) | 15. (d) | 16. (b) | 17. (c) | 18. (d) | 19. (b) | 20. (b) |
| 21. (c) | 22. (a) | 23. (d) | 24. (c) | 25. (b) | 26. (b) | 27. (c) | 28. (a) | 29. (b) | 30. (d) |
| 31. (c) | 32. (d) | 33. (a) | 34. (c) | 35. (c) | 36. (b) | 37. (d) | 38. (a) | 39. (a) | 40. (b) |

General English

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|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (c) | 2. (c) | 3. (c) | 4. (a) | 5. (d) | 6. (c) | 7. (a) | 8. (d) | 9. (c) | 10. (a) |
| 11. (d) | 12. (a) | 13. (c) | 14. (a) | 15. (c) | 16. (a) | 17. (d) | 18. (b) | 19. (a) | 20. (c) |
| 21. (a) | 22. (c) | 23. (d) | 24. (a) | 25. (a) | 26. (c) | 27. (b) | 28. (c) | 29. (c) | 30. (c) |
| 31. (a) | 32. (c) | 33. (d) | 34. (d) | 35. (b) | 36. (d) | 37. (b) | 38. (d) | 39. (a) | 40. (d) |