

# University of Health Sciences, Lahore;

MDCAT 2017



# BIOLOGY

1) Low partial pressure of oxygen in tissues favours \_\_\_\_\_ of oxyhaemoglobin.

- a) Dissociation
- b) Formation
- c) Stability
- d) Transformation

2) Respiratory tubules are termed as bronchioles when they attain the diameter \_\_\_\_\_ or lesser:

- a) 1.2cm
- b) 1cm
- c) 1mm
- d) 1.2mm

3) Elastic fibres are absent in the walls of \_\_\_\_\_ :

- a) Aorta
- b) Arteries
- c) Veins
- d) Capillaries

4) A type of blood cell that produces heparin is \_\_\_\_\_ :

- a) Basophil
- b) Neutrophil
- c) Eosinophil
- d) Monocyte

5) Thoracic lymph duct of the lymphatic system opens into \_\_\_\_\_ :

- a) Superior vena cava
- b) Subclavian Vein
- c) Inferior vena cava
- d) Renal vein

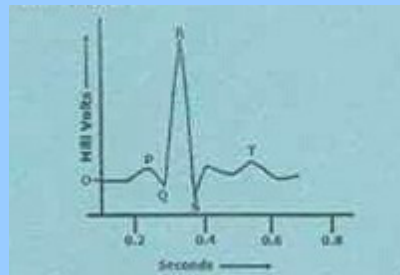
6) Select the part of nephron which is NOT permeable to water and stops its outflow:

- a) Glomerulus
- b) Proximal Tubule
- c) Ascending loop
- d) Descending loop

7) Vessels which carry blood to the glomerulus are called:

- a) Efferent arterioles
- b) Renal vein
- c) Vesa recta
- d) Afferent arterioles

8) In ECG, QRS wave represents:



- a) Ventricular systole
- b) Atrial systole
- c) Diastole
- d) Recovery systole

9) When water content in body becomes high, what will happen:

- a) ADH release will be inhibited
- b) ADH will be released in large amount
- c) Aldosterone will be released
- d) Anterior pituitary will produce ADH

10) The major factor in producing hypertonic urine is:

- a) Glomerulus
- b) Influence of aldosterone from
- c) ADH influencing on collecting duct
- d) Gradual increase in osmolarity .cortex to inner medula

11) What is the least selective process during urine formation:

- a) Reabsorption
- b) Pressure filtration
- c) Secretion
- d) Differential permeability

**12) The nerve impulse which jumps from node to node in myelinated neurons is called as:**

- a) Resting membrane potential
- b) Saltatory nerve impulse
- c) Threshold stimulus
- d) Initial nerve impulse

**13) The CNS is protected by:**

- a) Three layers of meninges
- b) One layer of meninx
- c) 4 layers of meninges
- d) 2 layers of meninges

**14) White matter of spinal cord is made up of:**

- a) Sensory nerve fibres
- b) Myelinated nerve fibres
- c) Motor nerve fibres
- d) Mixed nerve fibres

**15) There are evidences that high levels of aluminum can lead to the onset of:**

- a) Parkinson's disease
- b) Alzheimer's disease
- c) Lesch-Nyhan syndrome
- d) Fragile X-syndrome

**16) \_\_\_\_\_ is the structure in female reproductive system in which fertilization takes place:**

- a) Ovaries
- b) Uterus
- c) Cervix
- d) Oviduct

**17) Which of the following directly develops into sperms:**

- a) Primary spermatocytes
- b) Spermatids
- c) Secondary spermatocytes
- d) Spermatogonia

18) FSH stimulates the production of oestrogen hormone which has two targets \_\_\_\_\_ ;  
and \_\_\_\_\_ :

- a) Uterus, posterior pituitary
- b) Ovaries, uterus
- c) Uterus, anterior pituitary
- d) Ovaries, hypothalamus

19) Select the organelle which is only present in animal cells:

- a) Centrioles
- b) R.E.R
- c) Microtubules
- d) Ribosomes

20) Syphilis is a sexually transmitted disease and can also damage:

- a) Hair
- b) Heart
- c) P.N.S
- d) Birth canal

21) Spongy bone is always surrounded by:

- a) Compact bone
- b) Cartilage
- c) Osteoblast cells
- d) Osteoclast cells

22) Bone matrix is hardened by the:

- a) Haversian canals
- b) Canaliculfs
- c) Bone marrow tissues
- d) Calcium phosphate

23) The number of bones forming skull in man is:

- a) 8
- b) 14
- c) 20
- d) 22

**24) The spine consists of linear series of :**

- a) 33 bones
- b) 24 bones
- c) 12 bones
- d) 7 bones

**25) W.O.F changes occurs when skeletal muscles contract:**

- a) I-band shortens only
- b) A-band shortens and Z-lines move apart
- c) I-band shortens and Z-lines come close to each other
- d) Actin filament contracts

**26) The thyroxine hormones of thyroid glands act directly on:**

- a) Iodine metabolism
- b) Protein metabolism
- c) Glucose metabolism
- d) Basal metabolic rate

**27) All the hormones released by anterior pituitary are tropic hormones except:**

- a) TSH
- b) STH
- c) ACTH
- d) Gonadotrophin hormone

**28) W.O.F is endocrine as well as exocrine:**

- a) Liver
- b) Adrenals
- c) Thyroid
- d) Pancreas

**29) Ovulation is suppressed by progesterone via:**

- a) Only by inhibition of LH
- b) Inhibition of FSH & stimulation of LH
- c) Inhibition of LH & stimulation of FSH
- d) Inhibition of both FSH & LH

**30) The antibody molecule consists of \_\_\_\_\_ polypeptide chains:**

- a) Eight
- b) Four
- c) Six
- d) Two

**31) \_\_\_\_\_ cells survive for a few days and secrete a huge no of antibodies in blood, tissue fluids or lymph:**

- a) Memory cells
- b) B-lymphocytes
- c) T-lymphocytes
- d) Plasma cells

**32) The intermediate protection from infection of snake bite can be obtained by:**

- a) Active Immunity
- b) Natural active immunity
- c) Passive immunity
- d) Vaccination

**33) Chlorophyll molecule contains:**

- a) Mg<sup>++</sup>
- b) Ca<sup>++</sup>
- c) K<sup>+</sup>
- d) Na<sup>+</sup>

**34) The tail of chlorophyll molecule is embedded in:**

- a) Membrane of mitochondria
- b) Thylakoid membrane
- c) Membrane of S.E.R
- d) Membrane of R.E.R

**35) Carotenoids absorb light of:**

- a) Yellow-orange range
- b) Yellow-red range
- c) Orange-red range
- d) Blue-violet range

**36) Chlorophyll 'a' and chlorophyll 'b' differ in one of the functional groups... Chlorophyll 'a' has:**

- a) -CHO
- b) -OH
- c) -CH<sub>3</sub>
- d) -NH<sub>2</sub>

**37) Glycerate-3-phosphate in the presence of ATP and reduced NADP from light dependent stage is reduced to:**

- a) 3- carbon compound
- b) Ribulose biphosphate
- c) 5-carbon compound
- d) 6-carbon compound

**38) Calvin cycle occurs in:**

- a) Grana of chloroplast
- b) Stroma of chloroplast
- c) Chlorophyll (Reaction centre)
- d) Roots of plants

**39) Restriction enzyme EcoR1 cuts DNA to produce:**

- a) Blunt ends
- b) Non-palindromic ends
- c) Sticky ends
- d) Split ends

**40) Restriction endonucleases are produced by:**

- a) Fungi
- b) Algae
- c) Bacteria
- d) Viruses



41) DNA segments of different lengths can be separated by a process of:

- a) Western blotting
- b) Northern blotting
- c) Autoradiography
- d) Gel electrophoresis

42) The is the 1st heat stable component used in PCR:

- a) Taq-isomerase
- b) Taq-helicase
- c) Taq-polymerase
- d) Taq SSBp

43) Patients of cystic fibrosis (CF) produce thick mucus because of faulty:

- a) Trans-membrane carrier
- b) Cl<sup>-</sup> ions
- c) Na<sup>+</sup> ions
- d) Mucus membrane

44) Chemicals used for destroying agricultural competitors are known as:

- a) Antibiotics
- b) Pesticides
- c) Disinfectants
- d) Chemotherapeutic agents

45) How denitrification does occur in soils:

- a) Bacterial reduction of NO<sub>3</sub><sup>-</sup> ions to N<sub>2</sub> gas
- b) Active uptake of Nitrate ions by plant roots
- c) Drainage of manure from fields
- d) Leaching of nitrate ions

46) Process by which unrelated species evolve to functionally resemble each other is called:

- a) Convergent evolution
- b) Divergent evolution
- c) Co-evolution
- d) Parallel evolution

**47) W.O.F shows evidences from evolution through molecular biology:**

- a) Development of bronchial arches in vertebrate embryo
- b) Distribution of species
- c) Comparison of genes and proteins in different species
- d) Study of vestigial organs

**48) Large population size, random mating, no mutation and no emigration or immigration are the postulates of:**

- a) Hardy-Weinberg theorem
- b) Mendel's law of independent assortment
- c) Mendel's law of segregation
- d) Theory presented by Schleien and Schwann

**49) Pure breeding lines of pea were taken regarding seed shape – Round and wrinkled and were crossed with no intermediate between parents. All offsprings were found to be round. These results show:**

- a) Co-dominance
- b) Dominance-recessive relationship
- c) Incomplete dominance
- d) Over dominance relationship

**50) Base substitution, deletion and insertion are examples of:**

- a) Chromosomal aberration
- b) Point mutation
- c) Aneuploidy
- d) Euploidy

**51) The condition in which the heterozygote has a phenotype intermediate between contrasting homozygous parents is called as:**

- a) Dominance
- b) Incomplete dominance
- c) Co-dominance
- d) Over- dominance

**52) The interaction between different genes occupying different loci is:**

- a) Dominance ;
- b) Co-dominance ;
- c) Pleiotropy
- d) Epistasis

**53) Locus stands for:**

- a) Position of gene on homologous chromosome
- b) Regions of chromosomes
- c) Position of an allele within a DNA molecule
- d) Close regions of same chromosome

**54) Self fertilization of F-1 dihybrids, following independent assortment of alleles result in: ;**

- a) 3/16 Tall-round ; 3/16 dwarf-wrinkled
- b) 9/16 Tall-wrinkled ; 3/16 dwarf-round
- c) 9/16 Tall-round ; 3/16 Dwarf-round
- d) 3/16 Tall-wrinkled ; 3/16 Dwarf-round

**55) As a result of cross-fertilization of a true breeding pea plant having purple coloured flowers ; with that of white coloured flowers, the offsprings will have flowers with:**

- a) 1/4 purple ; 3/4 white
- b) 1/4 white ; 3/4 purple
- c) All white
- d) All purple

**56) The gene for red-green colour blindness is present on:**

- a) Y-chromosome
- b) X-chromosome
- c) Autosome 7
- d) Autosome 9

**57) W.O.F structures is present in both plant and animal cells but is absent in prokaryotic cells: ;**

- a) Centrioles ;
- b) Microtubule ;
- c) Plastids
- d) Sieve-tubes

**58) Cilia and flagella are absent in:**

- a) Viruses
- b) Bacteria
- c) Higher plants
- d) Lower animals

**59) DNA molecule in prokaryotes is:**

- a) Single, circular, double stranded molecule not bound by membrane
- b) Double, circular molecule
- c) Linear double stranded molecule
- d) Single, circular, double stranded, membrane bound

**60) Nucleoid is a structure not found in:**

- a) Campylobacter
- b) Cyanobacteria
- c) Spirochete
- d) Goblet cells

**61) Cell wall structure of a cell of unknown origin was studied and was found to contain polysaccharide chain linked with short chains of amino acid.. What do u think it can be??**

- a) Bacteria
- b) Fungi Cell
- c) Algae
- d) Cortex cells

**62) Ribosomes present in prokaryotes are:**

- a) 80S
- b) 60S
- c) 50S
- d) 70S

**63) Functionally mesosomes can be compared with:**

- a) Ribosomes
- b) Mitochondria
- c) Polysomes
- d) Golgi bodies

**64) Students were asked to give a guess about a unicellular organism with darkly stained nucleus.. W.O.F can be straight away excluded from the list:**

- a) Paramecium
- b) Amoeba
- c) Plasmodium
- d) Lactobacillus

**65) Binary fission is a characteristic cell division NOT found in:**

- a) Pseudomonas
- b) Campylobacter
- c) Euglena
- d) E.coli

**66) \_\_\_\_\_ are the specific structures related to monosaccharides:**

- a) Glycosidic bond
- b) Keto group
- c) Maltose
- d) Fructose

**67) \_\_\_\_\_ are the major site for storage of glycogen in animal's body:**

- a) Muscle and liver
- b) Around thighs and belly
- c) Around belly and hips
- d) Liver and kidneys

**68) The number of amina acids that have been found to occur in cells and tissues are:**

- a) 170
- b) 20
- c) 25
- d) 45

69) Most proteins are made up of \_\_\_\_\_ type of amino acids:

- a) 20
- b) 170
- c) 25
- d) 200

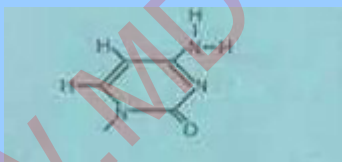
70) If in lipids there is an higher proportion of unsaturated fatty acids then it will be:

- a) Oils
- b) Waxes
- c) Phenols
- d) Fats

71) When X-rays are passed through crystalline DNA, it shows helix making one twist every:

- a) 2nm
- b) 3.4nm
- c) 34nm
- d) 4nm

72) Following is the structure of:



- a) Uracil
- b) Thymine
- c) Guanine
- d) Cytosine

73) All enzymes are \_\_\_\_\_:

- a) Fibrous proteins
- b) Low molecular weight proteins
- c) Lipoproteins
- d) Globular proteins

**74) The reactants on which enzyme works are:**

- a) Products
- b) Metabolites
- c) Substrates
- d) Catabolites

**75) W.O.F comprises of inorganic ions:**

- a) Coenzymes
- b) Activators
- c) Prosthetic group
- d) Apoenzyme

**76) W.O.F is a non-cellular infectious entity:**

- a) Mycoplasma
- b) Escherichia coli
- c) Herpes virus
- d) Diplococcus

**77) The viruses can reproduce:**

- a) Without invading any cell
- b) In bacterial cell
- c) By mitosis
- d) By meiosis

**78) The life cycle in which the phage kills the bacteria is known as:**

- a) Transduction
- b) Temperate phage cycle
- c) Lytic cycle
- d) Lysogenic phage cycle

**79) In W.O.F shapes, gut living symbiont Escherichia coli is found:**

- a) Round
- b) Oval
- c) Spiral
- d) Rod

80) Chitin, a chemical found in exoskeleton of arthropods is also found in cell wall of:

- a) Bacteria
- b) Fungi
- c) Cyanobacteria
- d) Algae

81) Snails are the intermediate hosts in:

- a) Fasciola hepatica
- b) Taenia solium
- c) Schistoma
- d) Ancylosoma duodenale

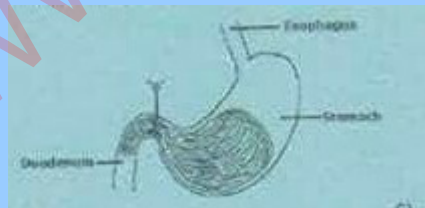
82) \_\_\_\_\_ is an intestinal parasite of man belonging to phylum nematoda:

- a) Taenia solium
- b) Wucheronia bancrofti
- c) Ascaris lumbricoides
- d) Schistoma

83) Food is diverted in the oesophagus by:

- a) Glottis
- b) Tongue
- c) Cheeks
- d) Epiglottis

84) Label 'a' in the following diagram:



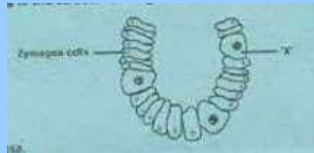
- a) Cardiac sphincter
- b) Sinoatrial valve
- c) Stomach valve
- d) Pyloric sphincter



85) Enzyme pepsin acts on:

Options	Substrate	Products
A	Protein	Polypeptides
B	Polypeptide	Dipeptides
C	Fats	Fatty acids/ glycerol
D	Protein	Amino Acids

86) Following is the structure of gastric glands in stomach wall where 'x' is:



- a) Mucosa
- b) Mucus cells
- c) Visceral fat cells
- d) Oxyntic cells

87) Label the part 'Y' in the following diagram:



- a) Pleura
- b) Diaphragm
- c) Chest cavity
- d) Intercoastal muscles

88) W.O.F is a respiratory disorder related to malnutrition:

- a) Cancer
- b) Asthma
- c) Emphysema
- d) Tuberculosis

# PHYSICS

1) The quantities which can be measured accurately are:

- a) Base quantities
- b) Physical Quantities
- c) Derived Quantities
- d) Supplementary quantities

2) An observer notes reading of scale from different angles (parallax) while measuring the length of wire, what type of error is possible:

- a) Systematic error
- b) Zero error
- c) Precised error
- d) Random error

3) The ratio of displacement along diameter of circle and total distance along circle is:

- a)  $1:\pi$
- b)  $\pi:1$
- c)  $2:\pi$
- d)  $\pi:2$

4) Arshad is driving down 7th street, he drives 150m in 18s.. Assume he doesnot speed up or slow down, what is his speed:

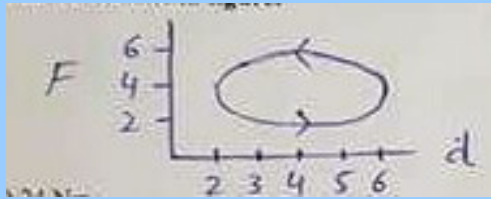
- a) 0.38 m/s
- b) 126 m/s
- c) 8.33 m/s
- d) 58.33 m/s

5) The distance travelled by a moving car with velocity 15 m/s in 2s, decelerates at 2m/s is equal to:

- a) 30m
- b) 34m
- c) 16m
- d) 26m

6) Total work done in figure is:

- a) 24 Nm
- b) 16 Nm
- c) 8 Nm
- d) Zero Nm



7) Work done will be zero if angle between force and displacement is:

- a)  $0^\circ$
- b)  $60^\circ$
- c)  $270^\circ$
- d)  $360^\circ$

8) If mass 'm' is dropped from height 'h' vertically, 'f' is the force of friction during downward motion and 'v' is the velocity at bottom, following will hold:

- a)  $\frac{1}{2}mv^2 = mgh + fh$
- b)  $mgh = \frac{1}{2}mv^2 - fh$
- c)  $fh = mgh + \frac{1}{2}mv^2$
- d)  $mgh = \frac{1}{2}mv^2 + fh$

9) A body moves in a circle with increasing angular velocity, at time 't' = 6s the angular velocity is 27rad/s... What is the radius of circle where linear velocity is 81cm/s:

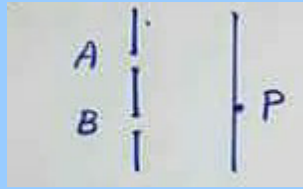
- a) 6cm
- b) 9cm
- c) 7cm
- d) 3cm

10) A moon rotates about its axis. In future scientists may wish to put a satellite into an orbit around the moon such that the satellite remains stationary above one point on moon surface, the period of rotation of moon about its axis is 27.4 days, what is the radius of required orbit?  
 $M_m = 7.35 \times 10^{22} \text{kg}$

- a)  $3.59 \times 10^7 \text{ m}$
- b)  $4.23 \times 10^7 \text{ m}$
- c)  $8.86 \times 10^7 \text{ m}$
- d)  $6.96 \times 10^6 \text{ m}$



16) Coherent lines emerge from two fine parallel slits 'A' and 'B' as shown in figure:



If 'P' is the position of nth dark fringe from centre of interference, then phase difference between wave train 'A' and 'B' is:

a)  $n\pi$  radian

c)  $(n+\frac{1}{2})\pi$  radian

b)  $2\pi n$  radian

d)  $(2n+1)\pi$  radian

17) The wavelength of light which produces second order spectrum on diffraction grating on which 5000 lines/cm are ruled at an angle of  $30^\circ$  will be:

a)  $6 \times 10^{-7}$  m

c)  $5 \times 10^{-7}$  m

b)  $4 \times 10^{-6}$  m

d)  $3 \times 10^{-6}$  m

18) Estimate pressure of air molecules at 273K, if mean square speed is  $500 \text{ m}^2/\text{s}^2$  and density of air is  $6 \text{ kg/m}^3$ :

a)  $1 \times 10^3$  Pa

c)  $1 \times 10^2$  Pa

b)  $2.5 \times 10^2$  Pa

d)  $2.7 \times 10^3$  Pa

19) 1 mole of a gas occupies volume  $1.00 \times 10^{-2} \text{ m}^3$  in a gas cylinder whose pressure is equal to  $2.50 \times 10^5$  Pa. The temperature of cylinder is:

a) 227K

c) 370K

b) 300K

d) 390K

20) The value of pressure and volume of fixed mass of gas in thermometer at triple point of water  $P_f = 1.00 \times 10^5 \text{ Pa}$  and  $V_f = 1 \times 10^{-3} \text{ m}^3$ . When  $P = 1.1 \times 10^5 \text{ Pa}$  and  $V = 1.2 \times 10^{-3} \text{ m}^3$ . Then temperature of gas is:

- a) 361K  
 b) 298K  
 c) 273K  
 d) 250K

21) A point charge at distance 'x' from another point charge experiences a force F of repulsion, which graph shows relationship of force F to 'x' :



22) The Coulombs force between two point charges  $q_1 = 1 \text{ C}$  and  $q_2$  is 2N. Where distance between them is 3m, The charge  $q_2$  is:

- a)  $1 \times 10^{-9} \text{ C}$   
 b)  $1 \times 10^9 \text{ C}$   
 c)  $2 \times 10^9 \text{ C}$   
 d)  $4 \times 10^{-9} \text{ C}$

23) Electric field strength at position vector  $r = (4i + 3j) \text{ m}$  caused by point charge  $q = 5 \mu\text{C}$  placed at origin is:

- a)  $1440i + 1080j \text{ V/m}$   
 b)  $1240i + 1280j \text{ N/C}$   
 c)  $1440i + 1080j \text{ N/m}$   
 d)  $1240i + 1080j \text{ N/C}$

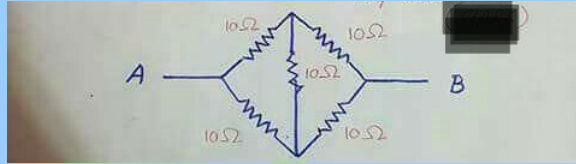
24)  $2.00 \times 10^6 \text{ e}$  passing through a conductor in 1 millisecond. Electric current through conductor is:

- a)  $3.2 \times 10^{-10} \text{ A}$   
 b)  $32.0 \times 10^{-9} \text{ A}$   
 c)  $320 \times 10^{-10} \text{ A}$   
 d)  $0.320 \times 10^{-10} \text{ A}$

25) A carbon resistor connected to a battery of 50V and 2A current is passing through it. If voltage is increased to 75V then current will be:

- a) 1.5 A
- b) 3A
- c) 4.5 A
- d) 6A

26) Effective resistance between point A and B is:



- a) 40 Ohms
- b) 50 Ohms
- c) 10 Ohms
- d) 30 Ohms

27) Electric current is flowing through the circuit as shown in figure, what will be the direction of magnetic lines of force:



- a) Clockwise
- b) Anticlockwise
- c) From top to bottom
- d) From bottom to top

28) The magnetic flux linked with a solenoid of area 'A', having 'N' turns at right angle to magnetic field is:

- a) NBA
- b) BA
- c)  $\frac{1}{2}NBA$
- d)  $BA\cos(\theta)$

29) A charge projected with velocity of 10m/s in a magnetic fields of 10T at an angle of 60°, if force exerted on charge is  $2.78 \times 10^{-17}$  N, then value of charge is:

- a)  $1.6 \times 10^{-19}$  C
- b)  $2.7 \times 10^{-19}$  C
- c)  $3.2 \times 10^{-19}$  C
- d)  $4.8 \times 10^{-19}$  C

30)The value of magnetic flux is 10Wb, when magnetic lines of force containing magnetic field strength of 1T passing through unit area of  $10\text{m}^2$ , then angle between magnetic field and unit area is:

- a)  $360^\circ$
- b)  $180^\circ$
- c)  $90^\circ$
- d)  $45^\circ$

31) A loop of 5 turns of wire is placed in uniform magnetic field of 0.5T, then area of loop shrinks at a constant rate of  $10 \text{ m}^2/\text{s}$ , the emf induced is:

- a) 2.5V
- b) 25V
- c) 250V
- d) 0.25V

32) The phase at negative peak of AC voltage is:

- a)  $\pi/2$
- b)  $\pi$
- c)  $3\pi/2$
- d)  $2\pi/3$

33) A 1.25cm diameter cylinder is subjected to load of 2500kg, stress on bar is:

- a) 200 Pa
- b)  $2 \times 10^5$  Pa
- c)  $2 \times 10^6$  Pa
- d)  $2 \times 10^9$  Pa

34) Output voltage of rectifier is not smooth, it can be made smooth by a circuit known as:

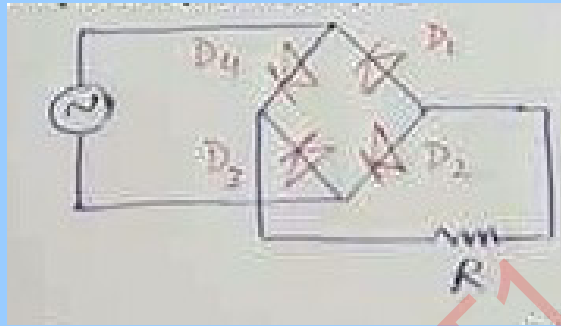
- a) Wheatstone Circuit
- b) Bridge circuit
- c) Filter circuit
- d) Ripple circuit



35) A wire of length 2m is attached with mass of 5kg vertically, tensile strain of wire is  $0.3 \times 10^{-3}$ , the extension in wire is:

- a) 1.5mm
- b) 2mm
- c) 0.15mm
- d) 0.6mm

36) What happens in positive cycle of AC input?



- a) D<sub>1</sub> and D<sub>3</sub> conducts
- b) D<sub>1</sub> and D<sub>2</sub> conducts
- c) D<sub>3</sub> and D<sub>4</sub> conducts
- d) D<sub>2</sub> and D<sub>4</sub> conducts

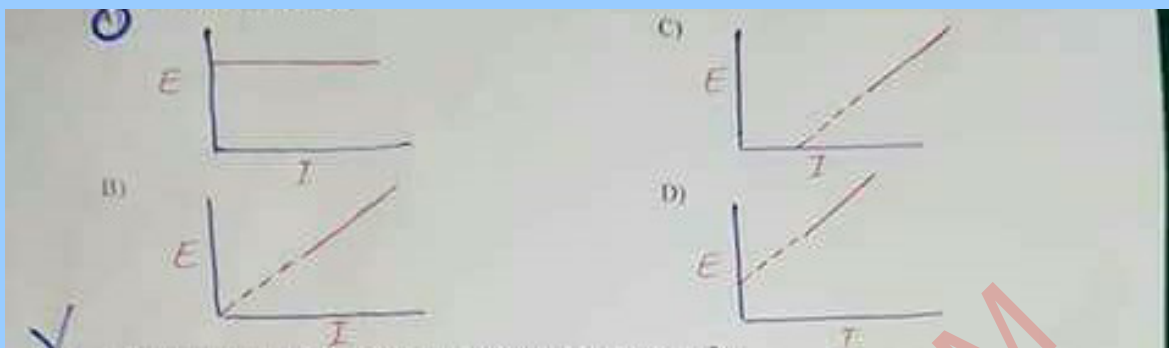
37) If signal is applied to input of non-inverting amplifier through resistance of 100 kOhm, and the value of feedback resistance is 10kOhm, the gain is:

- a) 11
- b) 10
- c) 1.1
- d) 0.11

38) The frequency of photon having momentum  $4.42 \times 10^{-26}$  Ns is:

- a)  $2.00 \times 10^{16}$  Hz
- b)  $2.00 \times 10^{14}$  Hz
- c)  $5.00 \times 10^{16}$  Hz
- d)  $2.00 \times 10^{18}$  Hz

39) The max K.E, 'E' of photoelectrons ejected by a light of certain wavelength from a metal is ; measured as a function of intensity 'I' of light. Which graph represents the way 'E' depends on ; 'I':



40) The momentum of wave where wavelength  $1.32 \times 10^{-9} \text{m}$

a)  $5.00 \times 10^{-25} \text{Ns}$

c)  $5.00 \times 10^{-43} \text{Ns}$

b)  $5.00 \times 10^{-26} \text{Ns}$

d)  $5.00 \times 10^{-44} \text{Ns}$

41) Ionization energy of hydrogen atom is:

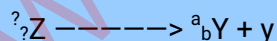
a) 0.54 eV

c) 3.39 eV

b) 0.85 eV

d) 13.6 eV

42) Complete the equation



a)  ${}^a_{b+1}Z$

c)  ${}^a_bZ$

b)  ${}^{a+1}_{b-1}Z$

d)  ${}^{a+1}_{b+1}Z$

43) The quantity of uranium is 400g, the amount of uranium left after 3 half lives is:

a) 25g

c) 100g

b) 50g

d) 200g

44) The mass of Radium atom decreases by  $8.6 \times 10^{-3}$  kg, mass defect equivalent to energy is:

- a) 4.48 MeV  
b) 4.84 MeV  
c)  $3 \times 10^2$  MeV  
d) 4.84 eV
- 

## ENGLISH

Choose the Best option:

1) A voice \_\_\_\_\_ us from the either side of the street

- a) Addled  
b) Hailed  
c) Transcend  
d) Purified

2) Many of the houses lacked even the basic \_\_\_\_\_

- a) Adroitness  
b) Anomaly  
c) Amenities  
d) Behest

3) The system has the \_\_\_\_\_ to run more than one program at the same time

- a) Acumen  
b) Ability  
c) Cadaver  
d) Adroitness

4) The soviet union was so vast and \_\_\_\_\_ that it comprised all the concievable world.

- a) Incisive  
b) Prolific  
c) Hermetic  
d) Platonic

## SPOT THE ERROR:

In the following sentences some segments of each sentences are underlined and written in brackets. Your task is to identify that underlined segment of ; the segment that contains the mistake that needs to be corrected. Fill the circle ; corresponding to that letter outside the bracket of the segment in the MCQ response ; form.

5) When Maulvi Abul reached (Shamim Ahmed's new shop,)<sup>a</sup> he found (a crowd)<sup>b</sup> had already assembled (there to watch)<sup>c</sup> (the proceeding.)<sup>d</sup>

6) (One of his hands was)<sup>a</sup> slipped (into a pocket)<sup>b</sup> of his overcoat (while in other)<sup>c</sup> he held a short polished cane which (every now and then)<sup>d</sup> he twirled jauntily.

7) The finder is requested (to return)<sup>a</sup> the purse (to the mayor office)<sup>b</sup> or to (Mr. James)<sup>c</sup> (the caretaker of this)<sup>d</sup> public hall.

8) He told them (how the glory of)<sup>a</sup> their country and (of its ancient throne)<sup>b</sup> would be increased if (the post of court)<sup>c</sup> acrobat (was created.)<sup>d</sup>

9) With this faith we will be able (to hew out)<sup>a</sup> (from the mountain)<sup>b</sup> (of despair,)<sup>c</sup> (a stone of hope.)<sup>d</sup>

10) (If it was possible)<sup>a</sup> to get (the necessities of life)<sup>b</sup> from the heavens (through prayers.)<sup>c</sup> Maulvi Abul would have prayed to Allah for a pair of shoes (for his Umda.)<sup>d</sup>

In each of the following questions four alternative sentences are given. Choose the ;  
CORRECT one and fill the circle corresponding to that letter in the MCQ Response Form.

11)

- a) Journalists must be well acquainted in the ethics of journalism.
- b) Journalists must be well acquainted with the ethics off journalism.
- c) Journalists must be well acquainted from the ethics of journalism.
- d) Journalists must be well acquainted with the ethics of journalism.

12)

- a) Heat the olive oil into a heavy pan.
- b) Heat the olive oil in a heavy pan.
- c) Heat the olive oil with a heavy pan.
- d) Heat the olive oil on a heavy pan.

13)

- a) She made no attempt to be friendly on anything but the most superficial level.
- b) She made no attempt to be friendly on anything but with most superficial level.
- c) She made no attempt to be friendly on anything but the most superficial level.
- d) She made no attempt to be friendly on anything but with the most superficial level.

14)

- a) He abdicated on favour of his son.
- b) He abdicated in favour of his son.
- c) He abdicated by favour of his son.
- d) He abdicated as favour of his son.

15)

- a) He was abetted by the deception by his wife.
- b) He was abetted from the deception by his wife.
- c) He was abetted in the deception by his wife.
- d) He was abetted to the deception by his wife.

16)

- a) The country is stepping back from the edge of an abyss.
- b) The country is stepping back in the edge of an abyss.
- c) The country is stepping back of the edge of an abyss.
- d) The country is stepping back through the edge of an abyss.

17)

- a) He lived at the style befitting a gentleman.
- b) He lived through the style befitting a gentleman.
- c) He lived by the style befitting a gentleman.
- d) He lived in the style befitting a gentleman.

18)

- a) He have decided to grow a beard and a moustache.
- b) He has decided to grow a beard and a moustache.
- c) He has been decided to grow a beard and a moustache.
- d) He have been decided to grow a beard and a moustache.

19)

- a) Their divorce filled a lot of column inches in the national newspaper.
- b) Their divorce filled lot of column inches in the national newspaper.
- c) Their divorce filled a lot of column inches to the national newspaper.
- d) Their divorce filled lot of column inches to the national newspaper.

20)

- a) The horse reared off on its hind legs.
- b) The horse reared of on its hind legs.
- c) The horse reared up on its hind legs.
- d) The horse reared down on its hind legs.

In each of the following question, four alternative meanings of a word are given. You have to select the **NEAREST CORRECT MEANING** of the given word and fill the appropriate circle on the MCQ response form.

21) CENTENNIAL:

- a) A hundredth anniversary.
- b) Relating to continents.
- c) Relating to sins.
- d) Relating to countries.

22) COBBLE:

- a) Demon
- b) Cockerel
- c) Convention
- d) Stone

**23) COCCYX:**

- |          |           |
|----------|-----------|
| a) Drug  | c) Bone   |
| b) Force | d) Shield |

**24) COMPLACENT:**

- |                   |                 |
|-------------------|-----------------|
| a) Self-regarding | c) Talented     |
| b) Self-conceited | d) Self-control |

**25) ACCESSORY:**

- |            |                |
|------------|----------------|
| a) Fitting | c) Mattock     |
| b) Canabis | d) Intrepidity |

**26) AFFINITY:**

- |              |               |
|--------------|---------------|
| a) Coenobium | c) Propensity |
| b) Magnate   | d) Tear       |

**27) AMORPHOUS:**

- |             |               |
|-------------|---------------|
| a) Flagrant | c) Voluptuous |
| b) Nebulous | d) Nugatory   |

**28) ADMONITION:**

- |               |                |
|---------------|----------------|
| a) Juvenility | c) Acquisition |
| b) Puberty    | d) Bashing     |



**29) AUDACIOUS:**

a) Mawkish

b) Autocratic

c) Perl

d) Oozy

**30) BOUQUET:**

a) Posy

b) Prolegomena

c) Necropsy

d) Damper

WWW.MDCAT1.COM

# CHEMISTRY

1) In  $\text{NO}_3^-$  the oxidation number of N is:

- a) +5  
b) +2  
c) +3  
d) -3

2) The  $E^\circ$  value of the standard copper half cell is +0.34, measured when it is connected with SHE i.e Standard Hydrogen Electrode. In this case the half cell reaction taking place at SHE is:

- a)  $2\text{H}^+_{(\text{aq})} + 2\text{e}^- \rightarrow \text{H}_2(\text{g})$   
b)  $\text{H}_2 \rightarrow 2\text{H}^+_{(\text{aq})} + 2\text{e}^-$   
c)  $2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{H}(\text{g})$   
d)  $\text{H}^2 \rightarrow 2\text{H}(\text{g}) + 2\text{e}^-$

3) Consider the following reversible reaction:



**Initial Concentration**

- ( $\text{CH}_3\text{-CH}_2\text{-OH}$ ) = 1 mol  
( $\text{CH}_3\text{-CH}_2\text{-O-CO-CH}_3$ ) = 0 mol  
( $\text{CH}_3\text{-COOH}$ ) = 1 mol  
( $\text{H}_2\text{O}$ ) = 0 mol

**Equilibrium Concentration**

- ( $\text{CH}_3\text{-CH}_2\text{-OH}$ ) = 0.33 mol  
( $\text{CH}_3\text{-CH}_2\text{-O-CO-CH}_3$ ) = 0.66 mol  
( $\text{CH}_3\text{-COOH}$ ) = 0.33 mol  
( $\text{H}_2\text{O}$ ) = 0.66 mol

**$K_c = 4$  at  $100^\circ\text{C}$**

What are new equilibrium concentrations of all species if 1 mole of  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{COOH}$  are added to this equilibrium mixture? (Apply Le-Chatelier's principle) (Temperature remains same) ( $K_c$  remains constant)

- a) ( $\text{CH}_3\text{COOH}$ ) = 0.333 mol  
( $\text{CH}_3\text{CH}_2\text{OH}$ ) = 1.333 mol  
( $\text{CH}_3\text{-CH}_2\text{-O-CO-CH}_3$ ) = 1.666 mol  
( $\text{H}_2\text{O}$ ) = 1.666 mol

b)  $(\text{CH}_3\text{COOH}) = 1.333 \text{ mol}$   
 $(\text{CH}_3\text{CH}_2\text{OH}) = 0.333 \text{ mol}$

$(\text{CH}_3\text{—CH}_2\text{—O—CO—CH}_3) = \text{mol}$   
 $(\text{H}_2\text{O}) = \text{mol}$

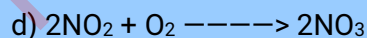
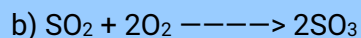
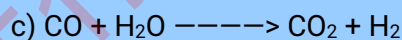
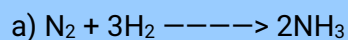
c)  $(\text{CH}_3\text{COOH}) = 0.666 \text{ mol}$   
 $(\text{CH}_3\text{CH}_2\text{OH}) = 0.666 \text{ mol}$

$(\text{CH}_3\text{—CH}_2\text{—O—CO—CH}_3) = 1.333 \text{ mol}$   
 $(\text{H}_2\text{O}) = 1.333 \text{ mol}$

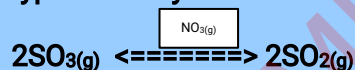
d)  $(\text{CH}_3\text{COOH}) = 0.333 \text{ mol}$   
 $(\text{CH}_3\text{CH}_2\text{OH}) = 0.333 \text{ mol}$

$(\text{CH}_3\text{—CH}_2\text{—O—CO—CH}_3) = 1.333 \text{ mol}$   
 $(\text{H}_2\text{O}) = 1.333 \text{ mol}$

4) For which of the following equilibrium reaction,  $K_c$  has no units:



5) Choose the type of catalysis in the following reaction:



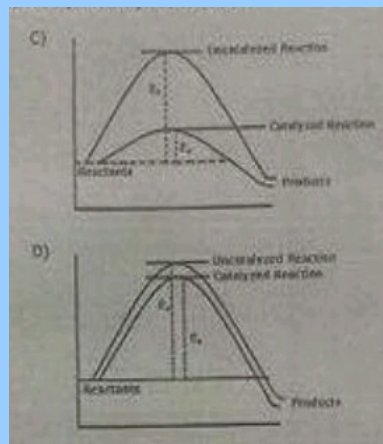
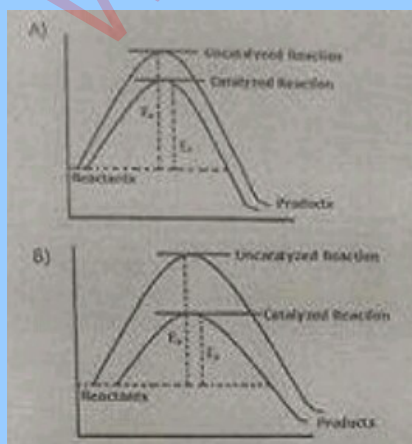
a) Homogenous Catalysis

c) Biological Catalysis

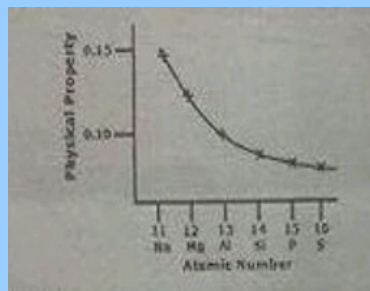
b) Heterogenous Catalysis

d) Gas Catalysis

6) Which one of the following graphs is the representation for more rapid catalysed reaction?

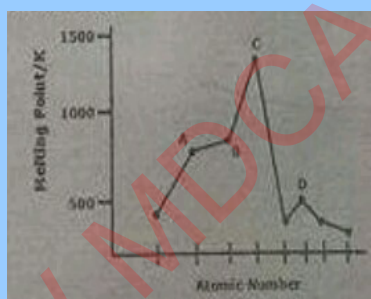


7) Following graph shows a physical property along the period 3 elements. Which physical property is shown in the graph?

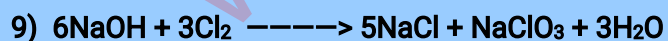


- a) Electron affinity  
 b) Non-metallic character  
 c) Atomic radius  
 d) Melting point upto group IV

8) The following sketch shows the melting point of eight elements with consecutive atomic numbers. Which element is silicon?



- a) A  
 b) B  
 c) C  
 d) D



In above disproportionation reaction the oxidation state of chlorine is changed from zero to \_\_\_\_\_ and \_\_\_\_\_.

- a) -1, +1  
 b) -1, +3  
 c) -1, +5  
 d) +1, +5

10) Which noble gas is alpha emitter?

- a) Xenon
- b) Radon
- c) Krypton
- d) Argon

11) Scandium has atomic number 21, which one will be its electronic configuration:

- a)  $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^3$
- b)  $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 3d^1$
- c)  $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 4p^1$
- d)  $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^1, 4p^2$

12) Violet colour of  $[Ti(H_2O)_4]^+$  ion is due to:

- a) Central metal ion
- b) Complex ion
- c) Water molecule
- d) Outer anion

13) Nitrogen gas reacts under \_\_\_\_\_ conditions:

- a) Standard
- b) Normal
- c) Cool
- d) Harsh

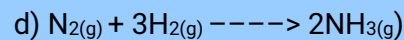
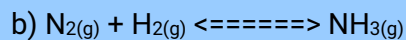
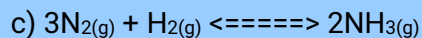
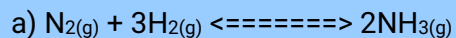
14) Liquid ammonia has become an important fertilizer for direct application to soil. It contains \_\_\_\_\_ nitrogen

- a) 46%
- b) 82%
- c) 14%
- d) 17%

15)  $SO_3$ , formed in contact process is absorbed in \_\_\_\_\_%  $H_2SO_4$ .

- a) 90
- b) 80
- c) 98
- d) 89

16) The balanced chemical equation to manufacture ammonia by Haber's process is:



17) Which one of the following is used as a typical catalyst for catalytic cracking:

a) Mixture of  $\text{SiO}_2$  and Ni

c) Mixture of Fe and MgO

b) Mixture of Pt and Cu

d) Mixture of  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$

18) The type of structural isomerism which arises due to the difference in nature of carbon chains or carbon skeleton is:

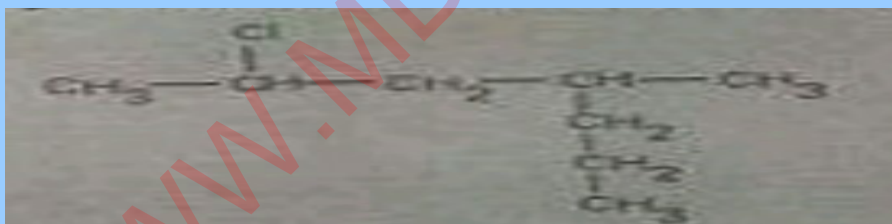
a) Chain isomerism

c) Cis-Trans isomerism

b) Position isomerism

d) Optical isomerism

19) Which one of the following is the best name according to IUPAC system for the formula given below:



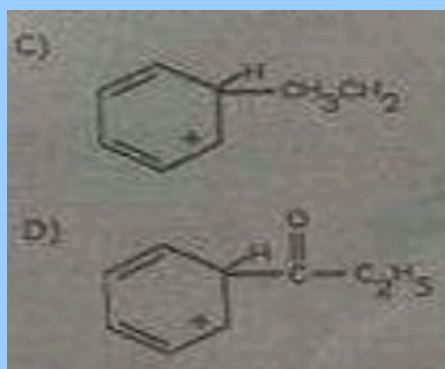
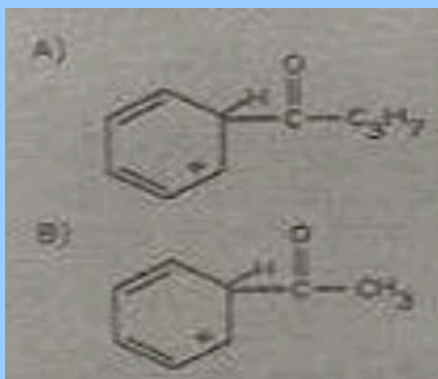
a) 4-methyl-6-chloro heptane

c) 2-chloro-4-n propyl hexane

b) 2-chloro-4-methyl heptane

d) 2-chloro-4-n propyl pentane

20) Immediate product formed when propanoyl chloride reacts with benzene is:



21) Which of the following are 3,5(meta) directing groups when second group is induced in them:

I=  $-\text{NH}_3$

II=  $-\text{CHO}$

III=  $-\text{COOH}$

IV=  $-\text{CH}_3$

a) II, III and IV

c) I and IV

b) II and III

d) I, II and IV

22) When benzene reacts with acetyl chloride ( $\text{CH}_3\text{COCl}$ ) in the presence of  $\text{AlCl}_3$ , acetophenone is formed. The electrophile in this reaction will be:

a)  $\text{CH}_3\text{C}^+\text{O}$

c)  $\text{C}^+\text{H}_3$

b)  $\text{AlCl}_3$

d)  $\text{CH}_3\text{COCl}$

23) The reaction of bromine with benzene in the presence of  $\text{FeBr}_3$  follows the mechanism of:

a) Electrophilic addition

c) Electrophilic substitution

b) Nucleophilic substitution

d) Nucleophilic addition

24) Which one of the following is halothane:

a)  $\text{Cl}-\text{CH}_2-\text{CH}_2-\text{Cl}$

c)  $\text{Cl}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{Br}$

b)  $\text{CF}_3-\text{CHCl}-\text{Br}$

d)  $\text{Br}-\text{CH}_2-\text{CH}_2-\text{Br}$

25) The non-stick lining of pans is:

a) Difluoroethane

c) Chloroethane

b) Chlorofluororyhane

d) Tetrafluoroethane

26) In elimination reaction, alcoholic KOH is used..  $\text{OH}^-$  in this case will act as:

a) Electrophile

c) Leaving group

b) Base

d) Acid

27) During the S<sub>N</sub>1 reactions, the fast reaction involves:

- a) Breakage of covalent bond
- b) Formation of carbocation
- c) Transition state
- d) Attack of nucleophile

28) Alcohol reacts slowly with Na-metal as compared to water because it has low concentration of H<sup>+</sup> ion which suggests that it is:

- a) Less acidic than water
- b) Less basic than phenol
- c) More acidic than phenol
- d) More acidic than water

29)  $\text{CH}_3\text{-CH}_2\text{-OH} + \text{PCl}_5 \longrightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{POCl}_3 + \text{HCl}$ ... Formation of HCl is the test for the presence of \_\_\_\_\_ in a compound:

- a) Alkyl group
- b) Hydroxyl Group
- c) Saturated alkyl group
- d) Acidic H<sup>+</sup> ion

30)  $\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \xrightarrow{\text{H}_2\text{SO}_4} \text{??}$  What will be the exact product?

- a) Diethyl ether
- b) Methyl propyl ether
- c) Ethyl acetate
- d) Butyl alcohol

31)  $\text{C}_2\text{H}_5\text{-SO}_3\text{H} \xrightarrow{\text{H}_2\text{O}} \text{C}_2\text{H}_5\text{-OH} + \text{H}_2\text{SO}_4$ , choose the correct type for this reaction from the following:

- a) Reduction
- b) Oxidation
- c) Hydroxylation
- d) Hydration

32) Ethanol reacts with HCN to form cyanohydrin, it is an example of:

- a) Nucleophilic addition
- b) Electrophilic addition
- c) Electrophilic substitution
- d) Nucleophilic substitution



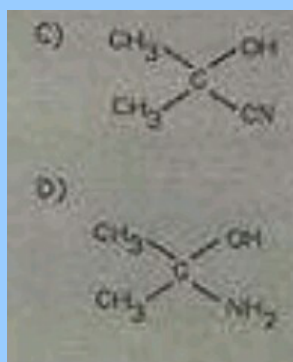
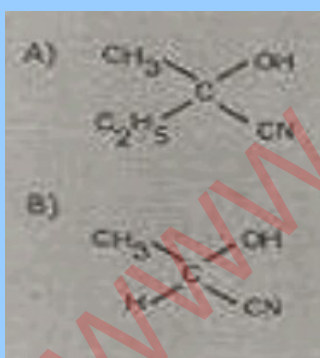
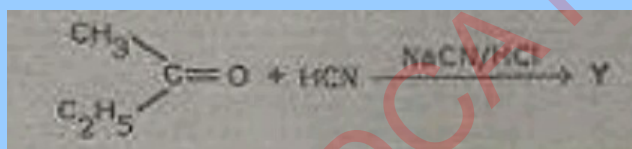
33) The reactions of aldehydes and ketones with ammonia derivatives  $G-NH_3$  to form compounds containing  $>C=N-C$  and water is known as \_\_\_\_\_ reaction:

- a) Nucleophilic addition  
 b) Nucleophilic substitution  
 c) Electrophilic addition  
 d) Addition elimination

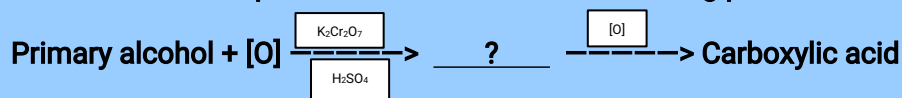
34) Which one of the following compounds will give iodoform test on treatment with aqueous iodine?

- a) 3-pentanone  
 b) Propanone  
 c) Propanal  
 d) Butanal

35) What will be the product of reaction given below:



36) In the reaction "?" represents which one of the following products:



- a) Ketone  
 b) Aldehyde  
 c) Formic acid  
 d) Ether

37) Compounds having  $-\text{CN}$  group are called as:

- a) Cyano compounds
- b) Nitro compounds
- c) Carbon nitrogen compounds
- d) Nitriles

38) Select the correct acidic strength order of chlorosubstituted acids:

- a)  $\text{CH}_3\text{COOH} > \text{ClCH}_2\text{COOH} > \text{Cl}_2\text{CHCOOH} > \text{Cl}_3\text{CCOOH}$
- b)  $\text{CH}_3\text{COOH} > \text{Cl}_2\text{CHCOOH} > \text{Cl}_3\text{CCOOH} > \text{ClCH}_2\text{COOH}$
- c)  $\text{Cl}_3\text{CCOOH} > \text{Cl}_2\text{CHCOOH} > \text{ClCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
- d)  $\text{Cl}_3\text{CCOOH} > \text{CH}_3\text{COOH} > \text{Cl}_2\text{CHCOOH} > \text{ClCH}_2\text{COOH}$

39) The phenoxide ion is more stable than ethoxide ion as:

- a) Lone pair on oxygen atoms overlap with the delocalized  $\pi$ -bonding system in benzene
- b) Oxygen atom is directly bonded with benzene ring in the phenoxide ion
- c) The negative charge is localized on oxygen atom of phenoxide ion
- d) The negative charge is delocalized on oxygen atom of ethoxide ion

40) Acidic character of amino acid is due to:

- a)  $-\text{NH}_2$
- b)  $-\text{N}^+\text{H}_3$
- c)  $-\text{COOH}$
- d)  $-\text{COO}^-$

41) IUPAC name of alanine is:

- a) 2-aminopropanoic acid
- b) 2-aminoethanoic acid
- c) 2-aminobutane-1,4-dioic acid
- d) 2-aminobutanoic acid



48) A researcher has prepared a sample of 1-bromopropane from 10g of 1-propanol. After purification he had made 12g of product. Which of the following is percentage yield:

- a) 60%
- b) 58%
- c) 90%
- d) 50%

49) Which one of the following has same number of molecules as present in 11g of  $\text{CO}_2$ :

- a) 4g of  $\text{O}_2$
- b) 4.5g of  $\text{H}_2\text{O}$
- c) 4g of Cl
- d) 1/4 moles of NaCl

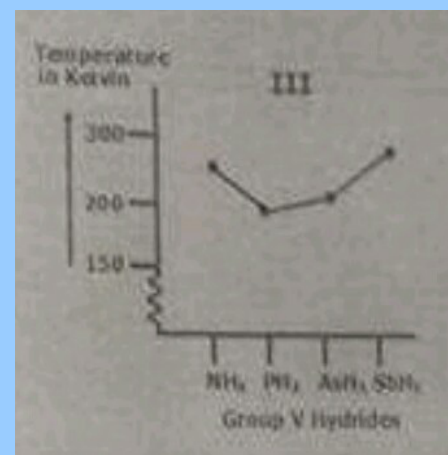
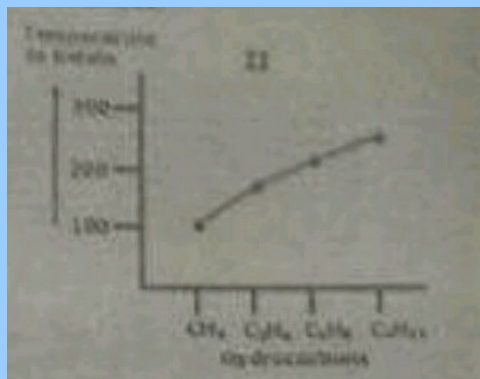
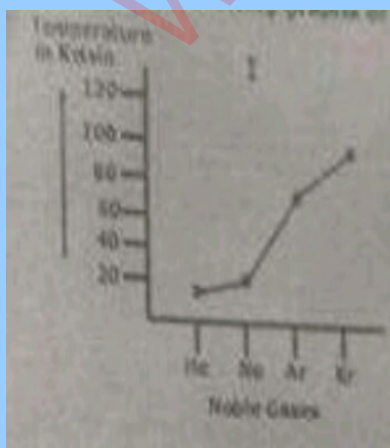
50) An organic sample consisting of carbon, hydrogen and oxygen was subjected to combustion analysis. 0.543g of this compound gave 1.039g of Carbon dioxide, 0.636g of water vapours. The empirical formula of this compound is:

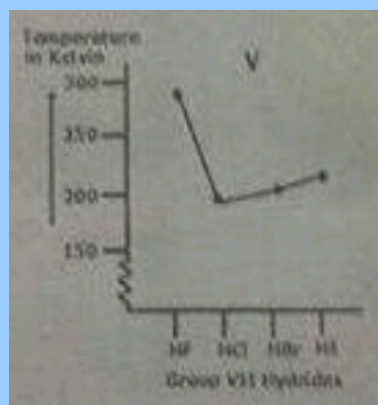
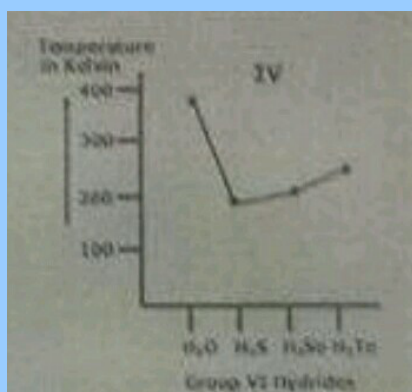
- a)  $\text{CH}_2\text{O}$
- b)  $\text{C}_4\text{H}_{12}\text{O}_2$
- c)  $\text{C}_3\text{H}_6\text{O}$
- d)  $\text{CH}_4\text{O}$

51) 28g of  $\text{N}_2$  will at STP occupy the volume of:

- a) 22.41  $\text{dm}^3$
- b) 44.82  $\text{dm}^3$
- c) 44.82  $\text{cm}^3$
- d) 2.241  $\text{dm}^3$

52) Study the following graphs of boiling points of some substances





Which of the above graph shows that some members of graph have hydrogen bonding:

- a) I + IV  
 b) II + IV  
 c) III + IV + V  
 d) I + II + III

53) No of electrons in  ${}_{31}^{69}\text{Ga}^{3+}$  will be:

- a) 28  
 b) 29  
 c) 30  
 d) 34

54) Isotopic symbol of ion of sulphur-33 is  ${}_{16}^{33}\text{S}^{-2}$ . How many no of protons and neutrons are present if the number of electrons are 18:

- a) P = 18, n = 15  
 b) P = 16, n = 17  
 c) P = 16, n = 16  
 d) P = 17, n = 16

# ANSWER KEYS

## BIOLOGY

1	a	2	c	3	c	4	a	5	b
6	c	7	d	8	a	9	a	10	c
11	b	12	b	13	a	14	b	15	b
16	d	17	b	18	c	19	a	20	b
21	a	22	d	23	d	24	a	25	c
26	d	27	b	28	d	29	a	30	b
31	d	32	c	33	a	34	b	35	d
36	c	37	a	38	b	39	c	40	c
41	d	42	c	43	a	44	b	45	a
46	a	47	c	48	a	49	b	50	b

51	d	52	d	53	c	54	d	55	d
56	b	57	b	58	a	59	a	60	d
61	a	62	d	63	b	64	d	65	c
66	b	67	a	68	a	69	c	70	a
71	b	72	d	73	d	74	c	75	b
76	c	77	b	78	c	79	d	80	b
81	a	82	c	83	d	84	d	85	a
86	d	87	b	88	d				

# PHYSICS

1	b	2	d	3	a	4	c	5	<u>d</u>
6	d	7	c	8	d	9	d	10	<u>c</u>
11	c	12	b	13	c	14	c	15	<u>c</u>
16	c	17	c	18	a	19	b	20	<u>a</u>
21	c	22	a	23	a	24	a	25	<u>b</u>
26	c	27	a	28	a	29	c	30	<u>b</u>
31	b	32	c	33	b	34	c	35	<u>d</u>
36	d	37	c	38	a	39	a	40	<u>X</u>
41	d	42	c	43	b	44	X		



## ENGLISH

1	b	2	c	3	b	4	c	5	d
6	c	7	b	8	d	9	b	10	a
11	d	12	b	13	c	14	b	15	c
16	a	17	d	18	b	19	a	20	c
21	a	22	d	23	c	24	a	25	a
26	c	27	b	28	d	29	c	30	a

# CHEMISTRY

1	a	2	b	3	c	4	c	5	a
6	c	7	c	8	c	9	c	10	b
11	b	12	a	13	d	14	b	15	c
16	a	17	d	18	a	19	b	20	d
21	b	22	a	23	c	24	b	25	d
26	b	27	d	28	a	29	b	30	c
31	d	32	a	33	d	34	b	35	a
36	b	37	d	38	c	39	a	40	b
41	a	42	c	43	a	44	d	45	c
46	b	47	X	48	b	49	b	50	c
51	a	52	c	53	a	54	b		