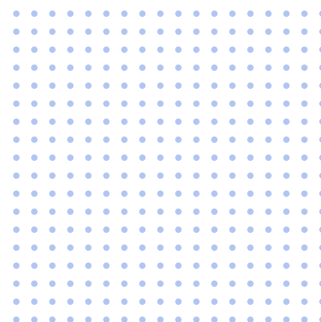




FOR KUET EXAM PREPARATION

# KUET 2024

## Question Paper · M.Sc. Nanotechnology

EXAM  
KUET

YEAR  
2024

TYPE  
Question Paper

SUBJECT  
M.Sc. Nanotechnology

Sr. No. .... **100** .....

# ENTRANCE TEST-2024

## SCHOOL OF BIOLOGICAL SCIENCES

### NANOTECHNOLOGY

Total Questions : 60  
Time Allowed : 70 Minutes

Question Booklet Series

**D**

Roll No. :

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

#### Instructions for Candidates :

1. Write your Entrance Test Roll Number in the space provided at the top of this page of Question Booklet and fill up the necessary information in the spaces provided on the OMR Answer Sheet.
2. OMR Answer Sheet has an Original Copy and a Candidate's Copy glued beneath it at the top. While making entries in the Original Copy, candidate should ensure that the two copies are aligned properly so that the entries made in the Original Copy against each item are exactly copied in the Candidate's Copy.
3. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. Use only blue/black ball point pen to darken the circle of correct/most appropriate response. In no case gel/ink pen or pencil should be used.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be '**Negative Marking**' for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
8. Only those candidates who would obtain positive score in Entrance Test Examination shall be eligible for admission.
9. Do not make any stray mark on the OMR sheet.
10. Calculators and mobiles shall not be permitted inside the examination hall.
11. Rough work, if any, should be done on the blank sheets provided with the question booklet.
12. OMR Answer Sheet must be handled carefully and it should not be folded or mutilated in which case it will not be evaluated.
13. Ensure that your OMR Answer Sheet has been signed by the Invigilator and the candidate himself/herself.
14. At the end of the examination, hand over the OMR Answer Sheet to the invigilator who will first tear off the original OMR sheet in presence of the Candidate and hand over the Candidate's Copy to the candidate.

SP-4492-D

1  
\*\*\*\*

[Turn over

SEAL

## CHEMISTRY

1. Bomb calorimeter is used to determine \_\_\_\_\_.  
 (A) molar heat capacity  
 (B) heat of combustion  
 (C) rate kinetics  
 (D) affinity
2. SN1 reaction of an optically active substrate results in :  
 (A) Racemization  
 (B) Retention of configuration  
 (C) Inversion of configuration  
 (D) Optical Resolution
3. Which is the correct order of reactivity (most reactive to least reactive) toward electrophilic aromatic substitution ?  
 (A)  >  >  >   
 (B)  >  >  >   
 (C)  >  >  >   
 (D)  >  >  > 
4. How many pairs of degenerate  $\pi$  molecular orbitals are found in benzene ?  
 (A) Three  
 (B) Two  
 (C) Four  
 (D) Six
5. The stereoisomers which can be interconverted by rotation of single bond are called :  
 (A) Conformational isomers  
 (B) Configurational isomers  
 (C) Geometrical isomers  
 (D) Chain isomers
6. In Newman projection formula, front carbon atom is shown by a \_\_\_\_\_.  
 (A) Circle  
 (B) Ellipse  
 (C) Dot  
 (D) Line
7. Heterolysis of which of the following bonds is likely to form a carbanion ?  
 (A) C-Cl  
 (B) C-Mg  
 (C) C-O  
 (D) C-N
8. Cannizzaro reaction involves migration of which of the following species ?  
 (A) Proton  
 (B) Hydride ion  
 (C) Carbene  
 (D) Carbanion

9. In Clemmensen Reduction carbonyl compound is treated with \_\_\_\_\_.  
 (A) Zinc amalgam + HCl  
 (B) Sodium amalgam + HCl  
 (C) Zinc amalgam + nitric acid  
 (D) Sodium amalgam +  $\text{HNO}_3$
10. Which of the following compounds has three equatorial positions occupied by nonbonding electron density ?  
 (A)  $\text{AlCl}_3$   
 (B)  $\text{XeF}_2$   
 (C) Dichlorodiamino platinum  
 (D) Alkyl magnesium bromide
11. Solubility of Potassium chloride shall be minimum in :  
 (A) Water  
 (B) Methanol  
 (C) Acetic acid  
 (D) Dimethyl ketone
12. Which of the following statements is *FALSE* about the Born-Haber cycle ?  
 (A) The cycle is an application of Hess Law  
 (B) It can be used to determine the lattice energy of an ionic solid  
 (C) The cycle helps in determining the amount of activation energy involved in a reaction  
 (D) It can be used to calculate the electron affinity of an atom
13. If the water molecule is linear :  
 (A) it would have a very high boiling point  
 (B) it would be highly reactive  
 (C) its dipole moment would be zero  
 (D) it would be highly ionic
14. Maxwell distribution of molecular velocities says that the fraction of total gas molecules that has acquired the most probable velocity will \_\_\_\_\_ with the increase in temperature.  
 (A) increase  
 (B) decrease  
 (C) remains constant  
 (D) can't say if we do not know the pressure
15. The unit of "a" in Van der Waals equation for one mole would be :  
 (A)  $\text{Nm}^2$   
 (B)  $\text{Nm}^3$   
 (C)  $\text{Nm}^4$   
 (D)  $\text{Nm}^5$
16. Which of the following has the highest value for a gas at a given temperature ?  
 (A) RMS velocity  
 (B) Average velocity  
 (C) Most probable velocity  
 (D) (A) and (C) have the same value and higher than (B)

17. For a cubic crystal with dimensions "a", the Miller indices of the planes for which interplanar spacing is "a" would be :
- (A) 100  
(B) 110  
(C) 200  
(D) 300
18. Which of the following coordination compounds cannot produce a white precipitate on reaction with silver nitrate ?
- (A)  $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$   
(B)  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$   
(C)  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$   
(D)  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$
19. The effective nuclear charge experienced by a valence p- electron in a boron atom calculated using Slater rules is :
- (A) 3.5  
(B) 4.5  
(C) 4.8  
(D) 2.6
20. In the case of the complex  $[\text{Ti}(\text{H}_2\text{O})_6]^{2+}$ , the geometry, the number of d-electrons and the magnetic character respectively is :
- (A) octahedral, 2, paramagnetic  
(B) octahedral, 6, paramagnetic  
(C) octahedral, 2, diamagnetic  
(D) tetrahedral, 2, paramagnetic
21. The complex with maximum CFSE is :
- (A)  $[\text{CoCl}_4]^{2-}$   
(B)  $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$   
(C)  $[\text{CoF}_3(\text{H}_2\text{O})_3]$   
(D)  $[\text{CoF}_6]^{3+}$
22. Which of the following thermodynamic laws introduces the concept of entropy ?
- (A) Zeroth law of Thermodynamics  
(B) First law of Thermodynamics  
(C) Second law of Thermodynamics  
(D) Third law of Thermodynamics
23. During the isothermal expansion of an ideal gas, which of the following thermodynamic quantities are zero ?
- (A) DH  
(B) DU  
(C) w  
(D) All of these
24. The number of the components present in the system  $\text{KCl-NaBr-H}_2\text{O}$  are :
- (A) 3  
(B) 4  
(C) 2  
(D) 1

25.  $C_v$  is given by :
- (A)  $(\partial E/\partial T)_v$   
 (B)  $(\partial E/\partial V)_T$   
 (C)  $(\partial E/\partial P)_v$   
 (D)  $(\partial V/\partial T)_P$
26. For the first-order reaction, after two half lives, the concentration of reactant is reduced to \_\_\_\_\_.  
 (A) 25%  
 (B) 75%  
 (C)  $100/e$  %  
 (D)  $100/e^2$  %
27. Molar conductance at infinite dilution for a compound AB is  $145.0 \text{ Scm}^2\text{mol}^{-1}$  and for CB is  $110.1 \text{ Scm}^2\text{mol}^{-1}$ . Limiting molar conductance for  $A^+$  is  $73.5 \text{ Scm}^2\text{mol}^{-1}$ . What is limiting molar conductance for  $C^+$  ion ?  
 (A)  $326.6 \text{ Scm}^2\text{mol}^{-1}$   
 (B)  $38.6 \text{ Scm}^2\text{mol}^{-1}$   
 (C)  $181.6 \text{ Scm}^2\text{mol}^{-1}$   
 (D)  $90.8 \text{ Scm}^2\text{mol}^{-1}$
28. Which of the electrodes is mostly used as indicating electrode of pH ?  
 (A) Calomel electrode  
 (B) Quinhydrone electrode  
 (C) Glass electrode  
 (D) Silver electrode
29. For a reaction,  $A(g) + 2B(g) \rightarrow C(g) + D(g)$ ,  $dx/dt = k [A][B]$ . The initial concentrations of A and B are respectively 0.1 M and 0.2 M. Now if the concentration of both A and B are reduced to 0.05 M, then the rate of reaction relative to the initial value would be :  
 (A)  $1/6$   
 (B)  $1/8$   
 (C)  $1/12$   
 (D)  $1/200$
30. Find the concentration of HCl, if 10 ml of 0.5 M  $\text{Ca}(\text{OH})_2$  is required to titrate 50 ml of HCl.  
 (A)  $1/10 \text{ M}$   
 (B)  $1/5 \text{ M}$   
 (C) 5 M  
 (D) 10 M
31. When sodium nitroprusside is added to Lassagne's extract, a violet colour is formed. It indicates the presence of \_\_\_\_\_.  
 (A) Sulphur  
 (B) Halogens  
 (C) Nitrogen  
 (D) Hydrogen
32. What is the SI unit of viscosity ?  
 (A) Candela  
 (B) Poiseuille  
 (C) Newton/m  
 (D) No units

## PHYSICS

33. Which of the following statement is *CORRECT*?
- (A) The interference pattern in Michelson interferometer is based on the principle of division of wave-front
- (B) The interference pattern in Young's two slit experiment is based on the principle of division of amplitude
- (C) A Michelson interferometer is basically a multiple-wave interferometer
- (D) Two-wave interference is characterized by a sinusoidal variation of light intensity with phase difference between the interfering waves
34. Poiseuille's formula for the volume 'V' of a liquid of density ' $\rho$ ' flowing in time ' $t$ ' through a capillary tube of length ' $L$ ' and radius ' $r$ ' under a pressure difference ' $P$ ' between the ends of the tube is :
- (A)  $V = (\pi Prt)/(8L\eta)$
- (B)  $V = (\pi Prt^4)/(8L\eta)$
- (C)  $V = (\pi P^4rt)/(8L\eta)$
- (D)  $V = (\pi Pr^4t)/(8L\eta)$
35. In a typical common emitter amplifier having a certain voltage gain, if the emitter bypass capacitor is removed then :
- (A) The circuit will become unstable
- (B) The voltage gain will decrease
- (C) The voltage gain will increase
- (D) The input impedance will decrease
36. If  $v_g$  represents the group velocity of waves in a certain medium, while its phase velocity is represented by  $v_p$ , then which of the following is correct ?
- (A) for a normal dispersive medium,  $v_p < v_g$
- (B) for a non-dispersive medium,  $v_p > v_g$
- (C) for an anomalously dispersive medium,  $v_p < v_g$
- (D) for a normal dispersive medium,  $\frac{dv_p}{d\lambda} < 0$ , where  $\lambda$  represents the wavelength
37. In a photoelectric effect experiment, ultraviolet light of wavelength  $320 \times 10^{-9}$  m falls on the photocathode with work function of 2.1 eV. The stopping potential should be approximately equal to :
- (A) 1.6 Volts
- (B) 1.8 milli Volts
- (C) 1.6 milli Volts
- (D) 1.8 Volts
38. The number of normal Zeeman splitting components of  $^1P \rightarrow ^1D$  transition is :
- (A) 4
- (B) 2
- (C) 3
- (D) 6

39. The approximate transmission probability  $T$  for a particle, of mass  $m$  and energy  $E$ , to tunnel through the barrier, of height  $U$  and width  $L$ , is proportional to (where  $h$  is the Planck's constant) :
- (A)  $\exp\left(-4\pi\frac{\sqrt{(U-E)}}{2mh}\right)$
- (B)  $\exp\left(-4\pi\frac{\sqrt{2m(U-E)}}{h^2}\right)$
- (C)  $\exp\left(-4\pi\frac{\sqrt{2m(U-E)}}{h}\right)$
- (D)  $\exp\left(-4\pi\frac{\sqrt{(U-E)}}{2mh^2}\right)$
40. Given two vectors  $\vec{A}$  and  $\vec{B}$ ,
- $$\vec{A} = (2\hat{i} - 5\hat{j} + 2\hat{k})$$
- $$\vec{B} = (4\hat{i} - 10\hat{j} + c\hat{k})$$
- What should be the value of 'c' so that  $\vec{A}$  and  $\vec{B}$  would become parallel to each other ?
- (A) 1
- (B) 2
- (C) 3
- (D) 4
41. If a particle is moving in a central force field, then which of the conservation laws is responsible for its motion to be restricted in a plane ?
- (A) conservation of angular momentum
- (B) conservation of energy
- (C) conservation of linear momentum
- (D) conservation of mass
42. Which of the following statements regarding the Galilean transformation is true ?
- (A) It describes the transformation between inertial reference frames moving at constant velocities relative to each other
- (B) It describes the transformation between inertial reference and non-inertial frames moving at constant velocities relative to each other
- (C) It predicts the constancy of the speed of light in all inertial reference frames
- (D) It applies to both linear and rotational motion
43. Which of the following statement is wrong regarding an electrostatic field  $E$  that exists in a given region  $R$  ?
- (A) Curl of  $E$  is zero
- (B)  $E$  can always be expressed as the gradient of a scalar field
- (C) The potential difference between any two arbitrary points in the region  $R$  is zero
- (D) The work done in a closed path lying entirely in  $R$  is zero

44. Which of the following statement is *NOT* *CORRECT* about Maxwell's Equations ?
- (A) Maxwell's equations are not invariant in form under Lorentz transformations
- (B) Maxwell's equations in free space are invariant under Lorentz transformation
- (C) Maxwell's equations show that electromagnetic waves travel with the same speed in every inertial frame
- (D) Maxwell's equations form the foundation of classical electromagnetism, classical optics and electric circuits
45. For isotropic dielectric media, the relative electric permittivity is a :
- (A) Vector quantity
- (B) Second-order Tensor quantity
- (C) Scalar quantity
- (D) None of the above because relative permittivity cannot be defined for an isotropic medium
46. The quantum mechanical operator for the Kinetic energy of a particle moving in one dimension is given by :
- (A)  $\frac{\hbar}{2m} \frac{d^2}{dx^2}$
- (B)  $-\frac{i\hbar}{2m} \frac{d}{dx}$
- (C)  $\frac{i\hbar}{2m} \frac{d}{dx}$
- (D)  $-\frac{\hbar^2}{2m} \frac{d^2}{dx^2}$
47. The ground state wavefunction for the hydrogen atom is proportional to :
- (A)  $\exp\left(\frac{-r}{a_0}\right)$
- (B)  $\exp\left(\frac{-r^2}{a_0}\right)$
- (C)  $\exp\left(\frac{r^2}{a_0}\right)$
- (D)  $\exp\left(\frac{r}{a_0}\right)$
48. A system has N non-degenerate eigen states populated by N non-interacting and distinguishable spin-zero particles in thermodynamic equilibrium. The entropy of the system is :
- (A)  $2 k_B T \ln N$
- (B)  $3 k_B T \ln N$
- (C)  $2N k_B \ln 3$
- (D)  $2N k_B \ln 2$
49. A Carnot cycle operates on a working substance between two reservoirs at temperatures T1 and T2 with T1 > T2. During each cycle, an amount of heat Q1 is extracted from the reservoir at T1 and an amount Q2 is delivered in the reservoir at T2. Which of the following statements/equations is NOT correct ?
- (A) Entropy of the hotter reservoir decreases
- (B) Entropy of the universe increases
- (C) Work done in one cycle is equal to Q1 – Q2
- (D)  $\frac{Q1}{T1} = \frac{Q2}{T2}$

50. Two gases separated by an impermeable but movable partition are allowed to freely exchange energy. At equilibrium, the two sides will have the same :
- (A) Volume and energy  
(B) Volume and temperature  
(C) Pressure and volume  
(D) Pressure and temperature
51. Which of the following statement is correct ?
- (A) Stefan-Boltzmann law states that the total rate of emission of radiant energy by a body per unit area is related to energy density as fifth power of its temperature  
(B) Rayleigh-Jeans formula for the distribution of energy treats blackbody radiation as photons which arise due to multiple reflections at the walls of the enclosure  
(C) According to Planck, blackbody radiation chamber is filled up not only with radiation but also with quantum resonators which exchange energy with the radiation  
(D) According to Rayleigh-Jeans formula the energy density of Blackbody spectrum within the wavelength range  $\lambda$  and  $\lambda + d\lambda$  is directly proportional to the fourth power of the wavelength
52. A primitive unit cell of a lattice has the following primitive vectors :
- $$\vec{a}_1 = \frac{a}{2}(\hat{i} + \hat{j} + \hat{k})$$
- $$\vec{a}_2 = \frac{a}{2}(-\hat{i} + \hat{j} + \hat{k})$$
- $$\vec{a}_3 = \frac{a}{2}(\hat{i} - \hat{j} + \hat{k})$$
- The reciprocal lattice corresponding to the above direct lattice is :
- (A) Face centred cubic  
(B) Body centred cubic  
(C) Simple cubic  
(D) Hexagonal
53. Particles that participate in the Strong Interactions are called :
- (A) Neutrinos  
(B) Leptons  
(C) Hadrons  
(D) Photons
54. An RC network produces a phase-shift of  $60^\circ$ . The number of such RC networks, that can be cascaded together and connected to a Common Emitter amplifier so that the final circuit behaves as an oscillator, are :
- (A) 6  
(B) 12  
(C) 18  
(D) 3

55. Which of the following statements is related to the observation that a heavy nucleus contains more neutrons than protons ?
- The nuclear force holding neutrons together in the nucleus is stronger compared to the force between protons
  - The range of the nuclear force between protons is shorter than that between neutrons, resulting in fewer protons being bound together by this force
  - Due to their instability, the number of protons within a nucleus decreases over time
  - It costs more energy to add a proton to a (heavy) nucleus than a neutron because of the Coulomb repulsion between protons
56. At low temperatures, the behaviour of the lattice contribution to the specific heat of a 3D solid will depend as a function of temperature  $T$  :
- $C_v$  is proportional to  $T$
  - $C_v$  is proportional to  $T^3$
  - $C_v$  is proportional to  $T^2$
  - $C_v$  is inversely proportional to  $T$
57. For a free particle the following process is forbidden because :
- $$p^+ \rightarrow n + e^+ + \nu_e$$
- where  $n$ ,  $e^+$ ,  $\nu_e$  is a neutron, a positron and a neutrino respectively.
- It violates the conservation of angular momentum
  - It violates the conservation of energy
  - A proton cannot decay into a neutron even inside the nucleus
  - It violates the conservation of linear momentum
58. The bound state of an electron and a positron is called positronium. If the ground state energy of the hydrogen atom is  $-13.6$  eV, the ground state energy of positronium will be :
- $-8.6$  eV
  - $-13.6$  eV
  - $-10.4$  eV
  - $-6.8$  eV
59. The magnetic field at a distance  $d$  from an infinite straight wire carrying a steady current  $I$  is proportional to :
- $I/d$
  - $I^2/d$
  - $I d$
  - None of the above
60. The interference pattern on a screen is created by illuminating the slits of a double slit interference setup with a collimated white light source. Which of the following statements about a red filter covering one slit is true ?
- No interference pattern is observed after the slit is covered with the red filter
  - Interference pattern remains unchanged with and without the red filter
  - A red interference pattern is observed
  - The central maximum is red with coloured higher order maxima

**OR**  
**BIOLOGY**

**(Biochemistry & Biotechnology)**

33. Which of the following covalent bond types are found in the structure of ATP ?
- (A) N-glycosidic, thioester, phosphodiester bond  
(B) N-glycosidic, phosphoanhydride, phosphomonoester bond  
(C) Ester, ether, N-glycosidic bond  
(D) Thioester, ether, N-glycosidic bond
34. The first committed step in glycolysis is mediated by :
- (A) Hexokinase  
(B) Phosphofructokinase-1  
(C) Aldolase  
(D) Enolase
35. Cori cycle takes place in :
- (A) Kidney and liver  
(B) Heart and muscle  
(C) Muscle and liver  
(D) Liver and heart
36. Which of the following is the prosthetic group of acyl carrier protein ?
- (A) 4'-phosphopantetheine  
(B) 3'-phosphopantetheine  
(C) 2'-phosphopantetheine  
(D) 1'-phosphopantetheine
37. Which of the following statements does NOT apply to IgG ?
- (A) Appears early in the primary immune response  
(B) Neutralizes bacterial toxins  
(C) Can fix complement  
(D) Crosses the human placenta
38. Which of the following is involved in type I hypersensitivity ?
- (A) IgE  
(B) IgG  
(C) IgA  
(D) IgM
39. Which of these cell types is an important antigen presenting cell?
- (A) Helper T cells  
(B) Natural Killer cells  
(C) Dendritic cells  
(D) Epithelial cells
40. Lacrimal secretions contain :
- (A) IgG  
(B) IgM  
(C) IgA  
(D) IgE

41. Which of the following are the aromatic amino acids ?
- Serine and Threonine
  - Phenylalanine and Tyrosine
  - Alanine and Proline
  - Lysine and Histidine
42. The reducing disaccharide cellobiose is linked by :
- $\alpha$  1-6 glycosidic linkage
  - $\beta$  1-4 glycosidic linkage
  - $\alpha$  1-4 glycosidic linkage
  - $\beta$  1-6 glycosidic linkage
43.  $\text{CH}_3-(\text{CH}_2)_{14}-\text{COOH}$  is the condensed structural formula of :
- Palmitic acid
  - Stearic acid
  - Caproic acid
  - Lauric acid
44. The degree of inhibition  $\alpha$  by a competitive inhibitor is obtained from :
- Measurement of  $V_{\text{max}}$
  - Measurement of the y-intercept on a Lineweaver-Burk Plot
  - Measurement of  $K_M$
  - Is unrelated to the binding affinity of the inhibitor to the enzyme
45. Fluid mosaic model of the cell membrane was given by :
- Gorter and Grendel
  - Henderson and Unwin
  - Davson and Danielli
  - Singer and Nicolson
46. The ribosome in eukaryotic cell is made up of :
- 50S and 30S subunits
  - 60S and 40S subunits
  - 50S and 40S subunits
  - 60S and 30S subunits
47. Which of the following is absent in Gram +ve bacteria ?
- Peptidoglycan
  - Flagella
  - Lipopolysaccharide
  - Cell wall
48. During which phase the chromosomes condense and move together, aligning in the center of the dividing cell ?
- Metaphase
  - Prophase
  - Telophase
  - Anaphase

49. Topoisomerases help in :

- (A) Elongation of DNA strand
- (B) Relaxing supercoiled DNA
- (C) Decatenating of interlocked DNA
- (D) Both (B) and (C) are correct

50. Which of the following is the stop codon ?

- (A) AUG
- (B) GUG
- (C) UAA
- (D) None of the above

51. Edwards syndrome is :

- (A) Trisomy 21
- (B) Trisomy 13
- (C) Trisomy 18
- (D) XXY

52. Which of the following events will cause the *E. coli*'s lac operon to operate ?

- (A) Glucose absence, Lactose presence
- (B) Glucose absence, Lactose absence
- (C) Glucose presence, Lactose presence
- (D) Glucose presence, Lactose absence

53. Which of the following hormones, first produced by recombinant DNA technology was approved by FDA in 1982 ?

- (A) Melatonin
- (B) Insulin
- (C) Estrogen
- (D) Glucagon

54. Which of the following statements about phagemids is *INCORRECT* ?

- (A) They are filamentous-phage-derived vectors containing the replication origin of a plasmid
- (B) They usually encode no or only one kind of coat proteins
- (C) Structural and functional proteins necessary to accomplish the life cycle of phagemid are provided by the helper phage
- (D) Are devoid of restriction enzymes recognition sites

55. Which of the following type of restriction endonuclease targets methylated DNA ?

- (A) Type I
- (B) Type II
- (C) Type III
- (D) Type IV

56. The temperature at which the denaturation of DNA occurs in PCR :

- (A) 60°C
- (B) 70°C
- (C) 94°C
- (D) 90°C

57. In agarose gel electrophoresis, the rate of migration of a DNA molecule through the gel is determined by :
- (A) Size and conformation of DNA molecule
  - (B) Type of agarose and its concentration
  - (C) Presence of ethidium bromide
  - (D) All of the above
58. Southern blotting is a technique for detection and quantification of :
- (A) DNA
  - (B) RNA
  - (C) Proteins
  - (D) All of the above
59. What is the role of goat anti-rabbit IgG horseradish peroxidase conjugate in an ELISA experiment ?
- (A) Primary Antibody
  - (B) Secondary Antibody
  - (C) Substrate
  - (D) None of the above
60. The use of green fluorescent protein in flow cytometry permits measurement of :
- (A) Cell size
  - (B) Cell granularity
  - (C) DNA content
  - (D) Intracellular gene expression