

Paper Code No: B25

Question Booklet No.

ENTRANCE EXAMINATION – 2021 – 22

120106

SET – B

Roll No.

SSF JAMIA MILLIA ISLAMIA
New Delhi

Nabish
Signature of Invigilator

Total Marks: 100

Time: 1 Hour 30 Minutes

Instructions to Candidates

1. Do not write your name or put any other mark of identification anywhere in the OMR Response Sheet. IF ANY MARK OF IDENTIFICATIONS IS DISCOVERED ANYWHERE IN OMR RESPONSE SHEET, the OMR sheet will be cancelled, and will not be evaluated.
2. This Question Booklet contains the cover page and a total of 100 Multiple Choice Questions of 1 mark each.
3. Space for rough work has been provided at the beginning and end. Available space on each page may also be used for rough work.
4. There is negative marking in Multiple Choice Questions. For each wrong answer, 0.25 marks will be deducted.
5. USE/POSSESSION OF ELECTRONIC GADGETS LIKE MOBILE PHONE, iPhone, iPad, pager ETC. is strictly PROHIBITED.
6. Candidate should check the serial order of questions at the beginning of the test. If any question is found missing in the serial order, it should be immediately brought to the notice of the Invigilator. No pages should be torn out from this question booklet.
7. Answers must be marked in the OMR Response sheet which is provided separately. OMR Response sheet must be handed over to the invigilator before you leave the seat.
8. The OMR Response sheet should not be folded or wrinkled. The folded or wrinkled OMR/Response Sheet will not be evaluated.
9. Write your Roll Number in the appropriate space (above) and on the OMR Response Sheet. Any other details, if asked for, should be written only in the space provided.
10. There are four options to each question marked A, B, C and D. Select one of the most appropriate options and fill up the corresponding oval/circle in the OMR Response Sheet provided to you. The correct procedure for filling up the OMR Response Sheet is mentioned below.

CORRECT METHOD

(A) (●) (C) (D)

WRONG METHODS

(A) (X) (C) (D) (A) (B) (C) (D) (A) (●) (C) (D) (A) (●) (C) (D) (A) (●) (C) (D) (A) (●) (C) (●)

1. The dimension of Reynold number is

☒ a) $M^0 L^0 T^0$

c) MLT^{-1}

b) MLT

d) $ML^{-1}T$

2.

A body is tied to one end of a string and whirled in a vertical circle of radius, r . The minimum velocity of the body at the lowest point for looping the vertical loop will be

a) \sqrt{gr}

b) $\sqrt{2gr}$

c) $\sqrt{5gr}$

d) $\sqrt{7gr}$

3.

A particle is projected at an angle θ with horizontal. If the horizontal range is thrice the greatest height of the projectile motion, then the angle θ will be

a) $\tan^{-1}(3)$

b) $\tan^{-1}(1/3)$

c) $\tan^{-1}(2/3)$

d) $\tan^{-1}(4/3)$

4.

The coefficient of restitution for a perfectly inelastic collision will be

a) $e = 0$

b) $e = 1$

c) $e > 1$

d) $e < 1$

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5.

Radius of gyration of a cylindrical rod of mass m and length L about axis of rotation perpendicular to its length and passing through its centre will be

a) $L/3$

b) $L/(2\sqrt{3})$

c) $ML^2/2$

d) $ML^2/12$

6. Young's modulus for a perfectly rigid body will be

- a) Infinity
c) Negative

- b) Zero
d) Positive

7. The range of Reynold number for streamline flow of a liquid will be

- a) 7000-5000
c) 3000-2000

- b) 5000-3000
d) 2000-0

8. The rms speed of oxygen molecule at a certain temperature is v . If the temperature is doubled and the oxygen gas dissociates into atomic oxygen, the new rms speed will be

- a) 0
c) $2v$

- b) v
d) $4v$

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9. A quantity of air at normal temperature is compressed very slowly to one third of its volume. The rise in temperature will be

- a) 0 K
c) 300 K

- b) 273 K
d) None of the above

10. The value of C_p/C_v for a monoatomic gas will be

- a) 2
c) 1.5

- ~~b) 1.67~~
d) 1.43

$\frac{C_p}{C_v} = \frac{5}{3}$

16. In a resistive ac circuit, voltage is ahead of current in phase by

a) 0

b) $\pi/2$

c) π

d) 2π

17. In RC circuit having dc power supply, the capacitor will be charged to 99% of the applied voltage in time duration of

a) RC

b) 2RC

c) 3RC

d) 5RC

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18. Infrared wave has a frequency smaller than

a) Radio wave

b) Micro wave

c) Visible wave

d) all of the above

19. Soap bubbles show beautiful colors when illuminated by white light because of

a) Polarization

b) Total internal reflection

c) Diffraction

d) Interference

20. The light of wavelength 600 nm is incident normally on a slit of width 3 mm. The linear width of central maxima on screen kept at 3 m away will be

a) 1 mm

b) 1.2 mm

c) 1.4 mm

d) 1.6 m

21. Plasmids are

- a) Extra chromosomal circular double stranded DNA
- b) Extra chromosomal circular single stranded DNA
- c) Circular double stranded DNA
- d) Supercoiled circular double stranded DNA

22. The genetic information in DNA is stored in

- a) Sugar
- b) Nitrogenous base
- c) Phosphate
- d) DNA polymerase

23. Genetic material in the living organisms consist of

- a) DNA
- b) RNA
- c) Sugar
- d) DNA and RNA

24. The Central dogma is described as

- a) DNA \rightarrow RNA \rightarrow protein
- b) RNA \rightarrow DNA \rightarrow protein
- c) Protein \rightarrow DNA \rightarrow RNA
- d) DNA \rightarrow protein

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25. The term cell was given by

- a) Robert Hooke
- b) Beadle and Tatum
- c) Meselson and Stahl
- d) Fredrick Griffith

26. The small molecules such as oxygen enters the cell by the process of

- a) Active diffusion
- b) Facilitated diffusion
- c) Passive diffusion
- d) Active transport

27. The composition of a plant cell wall is

- a) Protein
- b) Cellulose
- c) Sugar
- d) Starch

28. The cell organelle that is devoid of DNA

- a) Endoplasmic reticulum
- b) Mitochondria
- c) Chloroplast
- d) Nucleus

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29. The site of protein synthesis in a eukaryotic cell is

- a) Golgi complex
- b) Nucleus
- c) Lysosomes
- d) Rough endoplasmic reticulum

30. The stage of mitosis during which the chromosomes align on the equator of spindle fibres

- a) Telophase
- b) Anaphase
- c) Metaphase
- d) Cytokinesis

31. The DNA replication takes place during

- a) S phase
- b) G1 phase
- c) G0 phase
- d) Metaphase

32. The chromosome is halved during

- a) Mitosis
- b) Meiosis
- c) Metaphase
- d) Cell division

33. Koshland's theory of enzyme action is known as

- a) Lock and key theory
- b) Reduced fit theory
- c) Induced fit theory
- d) Enzyme-coenzyme theory

34. An enzyme catalyze the reaction by

- a) Decrease in activation energy
- b) Increase in activation energy
- c) Decrease in reaction time
- d) Increase in activation energy and increase in reaction time

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35. COVID-19 is caused by Coronavirus that is

- a) DNA virus
- b) RNA virus
- c) Retrovirus
- d) Poxvirus

36. Dengue virus can infect

- a) Humans
- b) Mosquitoes
- c) Human and mosquitoes
- d) Birds

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37. Peroxisomes are involved in

- a) Respiration
- b) Glycolysis
- c) Photosynthesis
- d) Glyoxylate cycle

38. Derivative of carotenoid is

- a) Absciscic acid
- b) Ethylene
- c) Gibberellins
- d) Indole 3 butyric acid

39. Turgidity of plant cell is maintained by

- a) Turgor pressure
- b) Osmotic pressure
- c) Wall pressure
- d) Cell wall

40. The products of light reaction include

- a) ATP
- b) ATP and NADPH₂
- c) NADPH₂
- d) CO₂

41. Double fertilization in plants is
- a) Fusion of 2 polar nuclei
 - b) Fusion of male and female gametes
 - c) Fusion of male and female gametes as well as fusion of second male gamete with polar nuclei
 - d) Fusion of male gamete with polar nuclei

42. Green manure or Biofertilizer is

- a) Rice
- b) Sesbania
- c) Wheat
- d) Sugarcane

43. Phagocytic hepatic cells are

- a) Epithelial cells
- b) Kupffer cells
- c) Acinar cells
- d) Adipocytes

44. The enzyme trypsin is found in

- a) Saliva
- b) Pancreatic secretion
- c) Bile
- d) Intestine

45. The basic requirements of PCR reaction include

- a) DNA segment to be amplified
- b) Primers
- c) DNA polymerase
- d) All of these

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46. Reverse transcriptase works on

- a) RNA as a template to form cDNA
- b) Protein as a template to form DNA
- c) DNA as a template to form RNA
- d) Protein as template to form RNA

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47. The DNA extracted from an organism is cut into small pieces with

- a) Polymerase enzyme
- b) Helicase enzyme
- c) Gyrase enzyme
- d) Restriction enzyme

48. Which of the following statements is false?

- a) Amplifying DNA means making many identical copies of starting DNA.
- b) The object of DNA cloning is to amplify DNA.
- c) The object of PCR is to amplify DNA
- d) The object of DNA sequencing is to amplify DNA

49. The ratio of absorption at 260nm to absorption at 280nm is commonly used to assess:

- a) The concentration of protein in your sample.
- b) The concentration of DNA and RNA.
- c) The purity of DNA and RNA with respect to protein.
- d) Whether your DNA or RNA is contaminated with organic substances.

50. Which of these dyes could you use to visualize DNA run on an agarose gel?
- a) Crystal violet
 - b) Ethidium Bromide
 - c) Coomassie blue
 - d) Ponceau S

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51. The colorless X-gal is converted to blue pigment by
- a) DNA Polymerase
 - b) Reverse Transcriptase
 - c) β -Galactosidase
 - d) α -Helicase

52. DNA polymerases does not-
- a) Replicate DNA
 - b) Synthesize DNA in 5'→3' direction
 - c) Synthesize DNA in 3'→5' direction
 - d) Require a primer to function

53. Transformation means
- a) Formation of a pilus
 - b) Acquiring DNA by bacterial from its environment
 - c) Plasmid containing a f factor
 - d) F+ and f- strains of bacteria

54. BCG vaccine is against
- a) Hepatitis
 - b) Tuberculosis
 - c) Smallpox
 - d) Diarrhea

55. The Covisheild vaccine against COVID-19 is

- a) Subunit
- b) mRNA
- c) Live attenuated
- d) viral vector based

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56. The pathogen that is related to cervical cancer

- a) Human immunodeficiency virus
- b) Herpes simplex virus
- c) Mycobacterium tuberculosis
- d) Human papilloma virus

57. Killing, inhibition, or removal of microorganisms that may cause disease is known as

- a) Sanitization
- b) Sterilization
- c) Disinfection
- d) Antisepsis

58. The antibiotic cephalosporin act by

- a) Disintegration of cell membrane
- b) Interfere with DNA replication
- c) Inhibit protein synthesis
- d) Inhibit cell wall synthesis

59. An individual with Turner syndrome has the following genotype
- a) 46, XX
 - b) 46, XY
 - c) 45, XO
 - d) 47, XXY

60. Tay Sach genetic disease is
- a) Autosomal recessive
 - b) Autosomal dominant
 - c) Due to autosome non-disjunction
 - d) Due to sex chromosome non-disjunction

61. The 9:7 ratio in the F₂ generation represents
- a) Incomplete dominance
 - b) Dominance
 - c) Epistasis
 - d) Complementary interaction

62. The ability of a plant cell to grow into a complete plant is known as
- a) Pluripotency
 - b) Cell culture
 - c) Cloning
 - d) Epistasis

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63. The segmented worms are classified in the phylum
- a) Nematods
 - b) Mollusca
 - c) Platyhelminthes
 - d) Annelids

64. Embryonic stem cell

- a) Differentiated cells
- b) Cannot divide
- c) Are derive from adults
- d) Pluripotent

65. The bacteria that are useful in genetic engineering are

- a) Nitrosomonas and Azotobacter
- b) Azotobacter and Rhizobium
- c) Escherichia and Agrobacterium
- d) Nitrosomonas and Rhizobium

66. The technique that is used for diagnosis of diseases is

- a) SDS-PAGE
- b) Polymerase Chain Reaction
- c) Transformation
- d) Transduction

67. Bt cotton produces the toxin

- a) Extotoxin
- b) Cry toxin
- c) A-B toxin
- d) Cytotoxin

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68. Sanctuary that is famous for endangered species such as dolphin and gharial is

- a) Gulf of Kutch Marine National Park
- b) Mahatma Gandhi Marine National Park
- c) Gahirmatha Marine Wildlife Sanctuary
- d) National Chambal Sanctuary

69. The zones of fresh water ecosystem are
- a) Littoral, limnetic, tidal and benthic
 - b) Littoral, limnetic, tidal
 - c) Littoral and tidal
 - d) Littoral, limnetic and profundal

70. The technique used to study the genetic abnormalities in fetus
- a) RT-PCR
 - b) Amniocentesis
 - c) ELISA
 - d) Pregnancy test

71. Insulin is being commercially produced from
- a) Rhizobium
 - b) Agrobacterium
 - c) Escherichia
 - d) Saccharomyces

72. During vigorous exercise, glucose is converted into
- a) Glycogen
 - b) Pyruvic acid
 - c) Fructose
 - d) Lactic acid

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73. Human testosterone is produced by
- a) Epididymis
 - b) Leydig cells
 - c) Seminiferous tubule
 - d) Sertoli cells

74. Active transport is

- a) Movement of ions from higher to lower concentration
- b) Movement of ions through semi-permeable membrane
- c) Movement of ions through permeable membrane
- d) Movement of ions from lower to higher concentration

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75. The internal pacemaker that controls biological rhythms

- a) is located in the heart
- b) is located in the brain
- c) is located in the lungs
- d) is located in the kidneys

76. The nerve cells communicate through

- a) Terminals
- b) Endings
- c) Receptors
- d) Synapse

77. The antibodies found in the person with type A blood group

- a) Anti-A, but not anti B
- b) neither anti-A nor anti B
- c) Both anti-A and anti B
- d) Anti-B, but not anti-A

78. The AIDS patient develop secondary infections due to

- a) Fever
- b) Mycobacterium
- c) Decrease in immunity
- d) Weakness

79. The pathogen that is responsible for microcephaly
- a) Mycobacterium tuberculosis
 - b) Rhizobium
 - c) Corona virus
 - d) Zika virus

80. Sexually transmitted diseases are
- a) Gonorrhea, cervical cancer and HIV
 - b) Muscular dystrophy and hemophilia
 - c) Tay Sach disease and diarrhea
 - d) Colour blindness, typhoid and Dengue fever

81. In Freundlich adsorption isotherm, the value of $1/n$ is
- a) Between 0 and 1 in all cases.
 - b) Between 2 and 4 in all cases
 - c) 1 in case of physisorption
 - d) 1 in case of chemisorption.

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82. Thermodynamics is not concerned about
- a) Energy changes involved in a chemical reaction
 - b) The extent to which a chemical reaction proceeds
 - c) The rate at which a reaction proceeds
 - d) The feasibility of a chemical reaction

83. What is SI unit of viscosity coefficient (η)?

a) Pascal

b) Nsm^{-2}

c) $\text{km}^{-2} \text{ s}$

d) N m^{-2}

84. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures will show a positive deviation from Raoult's law?

a) Methanol and acetone

b) Chloroform and acetone

c) Nitric acid and water

d) Phenol and aniline

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85. Extent of physisorption of a gas increase with

a) Increase in temperature

b) Decrease in temperature

c) Decrease in surface area of adsorbent.

d) Decrease in strength of van der Waals forces

86. In an exothermic reaction, heat is evolved, and system loses heat to the surrounding. For such system

a) q_p will be negative

b) ΔH will be negative

c) q_p will be positive

d) Both A and B are correct

87. The value of rate constant of a pseudo first order reaction
- Depends on the concentration of reactants present in small amount
 - Depends on the concentration of reactants present in excess
 - is independent of the concentration of reactants
 - Depends only on temperature
88. When copper ore is mixed with silica, in a reverberatory furnace copper matte is produced. The copper matte contains
- Sulphides of copper (II) and iron (II)
 - Sulphides of copper (II) and iron (III)
 - Sulphides of copper (I) and iron (II)
 - Sulphides of copper (I) and iron (III)
89. Which of the following pairs of ions are isoelectronic and isostructural?
- | | |
|---|--|
| a) CO_3^{2-} , NO_3^- | b) ClO_3^- , CO_3^{2-} |
| c) SO_3^{2-} , NO_3^- | d) ClO_3^- , SO_3^{2-} |

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90. There are 14 elements in actinoid series. Which of the following elements does not belong to this series?
- | | |
|-------|-------|
| a) U | b) Np |
| c) Tm | d) Fm |

[21]

91. Why is HCl not used to make the medium acidic in oxidation reactions of KMnO_4 in acidic medium?

- a) Both HCl and KMnO_4 act as oxidising agents
b) KMnO_4 oxidizes HCl into Cl_2 which is also an oxidising agent
c) KMnO_4 is a weaker oxidising agent than HCl .
d) KMnO_4 acts as a reducing agent in the presence of HCl

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92. Due to the presence of ambidentate ligands coordination compounds show isomerism. Palladium complexes of the type $[\text{Pd}(\text{C}_6\text{H}_5)_2(\text{SCN})_2]$ and $[\text{Pd}(\text{C}_6\text{H}_5)_2(\text{NCS})_2]$ are

- a) Linkage isomers b) Coordination isomers
c) Ionization isomers d) Geometrical isomers

93. Hydrogen resembles halogens in many respects for which several factors are responsible. Of the following factors which one is most important in this respect?

- a) Its tendency to lose an electron to form a cation
b) Its tendency to gain a single electron in its valence shell to attain stable electronic configuration
c) Its low negative electron gain enthalpy value
d) Its small size

94. Alkali metals react with water vigorously to form hydroxides and dihydrogen. Which of the following alkali metals reacts with water least vigorously?

a) Li

c) K

b) Na

d) Cs

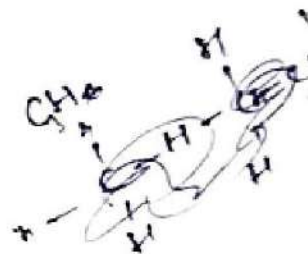
95. Arrange the following hydrogen halides in order of their decreasing reactivity with propene.

a) $\text{HCl} > \text{HBr} > \text{HI}$

c) $\text{HI} > \text{HBr} > \text{HCl}$

b) $\text{HBr} > \text{HI} > \text{HCl}$

d) $\text{HCl} > \text{HI} > \text{HBr}$



96. Which of the following statements is not true about classical smog?

a) Its main components are produced by the action of sunlight on emissions of automobiles and factories

b) Produced in cold and humid climate

c) It contains compounds of reducing nature

d) It contains smoke, fog and sulphur dioxide

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97. The process of converting alkyl halides into alcohols involves

a) Addition reaction

b) Substitution reaction

c) Dehydrohalogenation reaction

d) Rearrangement reaction

98. Hoffmann Bromamide Degradation reaction is shown by
- a) ArNH_2
 - b) ArCONH_2
 - c) ArNO_2
 - d) ArCH_2NH_2

99. Which of the following species are involved in the Carbylamine test?

- a) $\text{R}-\text{NC}$
- b) CHCl_3
- c) COCl_2
- d) Both A and B

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100. Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho and para halo compounds. The reaction is

- a) Electrophilic elimination reaction
- b) Electrophilic substitution reaction
- c) Free radical addition reaction
- d) Nucleophilic substitution reaction