

M.Sc. in Forensic Science

Set No. 1

Code No. (472) Question Booklet No.

00700

17P/302/23(i)

(To be filled up by the candidate by blue/black ball-point pen)

Roll No.

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Serial No. of OMR Answer Sheet

207

221

Day and Date

(Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES

(Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)

1. Within 30 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall except the Admit Card without its envelope.
3. A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided. Only the Answer Sheet will be evaluated.
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.
6. No overwriting is allowed in the entries of Roll No., Question Booklet no. and Set no. (if any) on OMR sheet and Roll No. and OMR sheet no. on the Question Booklet.
7. Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.
8. Each question in this Booklet is followed by four alternative answers. For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet.
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. Deposit only OMR Answer Sheet at the end of the Test.
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

Total No. of Printed Pages : 48

[उपर्युक्त निर्देश हिन्दी में अन्तिम आवरण पृष्ठ पर दिये गए हैं।]

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SEAL



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ROUGH WORK
रफ़ कार्य

• 122

Mux. in Forensic Science Code No (472)

2017

17P/302/23(1)

No. of Questions : 240

Time : 2 Hours

Full Marks : 360

Note : (1) Attempt as many questions as you can. Each question carries 3 [Three] marks. **One mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question.**

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

(3) This question paper contains **two** Sections, viz : **Section-A** and **Section-B**. Details of **Section-A** and **Section-B** are as follows :

(a) **Section-A** contains **60** questions from General Sciences and **20** questions of General Nature.

(b) **Section-B** contains **four** sub-sections namely : **Biology, Chemistry, Mathematics** and **Physics** with **40** questions in each. The candidate has to select **only one** of the four sub-sections of **Section-B**.

SECTION - A

01. Forensic Science is the application of science to :

- (1) those criminal laws that are enforced by police agencies
- (2) those civil laws that are enforced by police agencies
- (3) those religious laws that are enforced by police agencies
- (4) those criminal and civil laws that are enforced by police agencies



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02. Agglutination describes :

- (1) the separation of red blood cells by the action of an antibody
- (2) the clumping together of red blood cells by the action of an antibody
- (3) the non-clumping of red blood cells by the action of the antibody
- (4) the dissolution of red blood cells by the action of the antibody

03. Y-chromosome is :

- (1) the male sex hormones
- (2) the female sex hormones
- (3) the male sex chromosome
- (4) the female sex chromosome

04. The power of a lens is measured in :

- | | |
|--------------|-------------|
| (1) Diopters | (2) Aeon |
| (3) Lumen | (4) Candela |

05. Albert Einstein was awarded Nobel Prize for his path-breaking research & formulation of the :

- (1) Theory of Relativity
- (2) Law of Photo-electric Effect
- (3) Principle of Wave Particle Duality
- (4) Theory of Critical Opalescence

06. L.P.G. is a hydrocarbon consisting of a mixture of :

- | | |
|------------------------|------------------------|
| (1) Methane and Butane | (2) Propane and Butane |
| (3) Ethane and Propane | (4) Ethane and Butane |

07. "Pencillin" which is used as an antibiotic, is obtained from :
- | | |
|--------------|-------------|
| (1) Bacteria | (2) Fungi |
| (3) Algae | (4) Lichens |
08. "Amalgam" is term for an alloy of a metal with :
- | | |
|------------|---------------|
| (1) Copper | (2) Mercury |
| (3) Lead | (4) Aluminium |
09. News websites deliver customized 'feeds' of content to their readers via RSS, which stands for :
- (1) Really Simple Syndication
 - (2) Really Social Syndication
 - (3) Registered Subscriber Syndication
 - (4) Recly Simple Synchronisation
10. Pest - resistant cotton commonly known as 'Bt-Cotton' is genetically engineered by inserting a gene from a :
- | | |
|----------------|-------------|
| (1) Bacterium | (2) Virus |
| (3) Micrpalgae | (4) Protist |
11. Brass gets discoloured in air because of the presence of which of the following gases in air :
- | | |
|--------------------|----------------------|
| (1) Oxygen | (2) Hydrogensulphide |
| (3) Carbon dioxide | (4) Nitrogen |
12. 'Anemophily' is pollination by :
- | | |
|-----------|----------|
| (1) Birds | (2) Wind |
| (3) Ants | (4) Bats |
13. Which of the following is a non metal that remains liquid at room temperahere ?
- | | |
|----------------|-------------|
| (1) Phosphorus | (2) Bromine |
| (3) Chlorine | (4) Helium |



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14. Chlorophyll is a naturally occurring chelate compound in which central metal is :

- | | |
|------------|---------------|
| (1) Copper | (2) Magnesium |
| (3) Iron | (4) Calcium |

15. Which of the following is used in pencils ?

- | | |
|--------------|----------------|
| (1) Graphite | (2) Silicon |
| (3) Charcoal | (4) Phosphorus |

16. Which of the following substances undergo 'Sublimation' on heating ?

(A) Iodine (B) Naphthalene (C) Camphor

- | | |
|-------------|-----------------|
| (1) A and B | (2) A and C |
| (3) B and C | (4) All of them |

17. Consider the following statements :

- A. Radon is the heaviest gas
- B. Astatine is the rarest element of the earth
- C. Graphite which is a non-metal is also an electrical conductor.

Which of the following Statement(s) is/are correct ?

- | | |
|------------|--------------|
| (1) Only B | (2) A & B |
| (3) B & C | (4) A, B & C |

18. Which of the following is used as a moderator in nuclear reactor ?

- | | |
|-------------|--------------------|
| (1) Thorium | (2) Graphite |
| (3) Radium | (4) Ordinary water |

19. "Principle of Exchange" lies on the fact that :
- (1) a mutual exchange of traces takes place between the criminal, the victim and the objects involved in the crime
 - (2) an unilateral exchange of traces takes place between the criminal, the victim and the objects involved in the crime
 - (3) an exchange of traces takes place between the crime spot and the criminal
 - (4) no exchange of traces take place between the crime spot and the victim
20. 'Entomology' is study of :
- | | |
|-----------------|------------|
| (1) trees | (2) bugs |
| (3) fertilizers | (4) animal |
21. Misappropriation, negligences cheating, bulidging collapose, industrial road, train and air accidents come under :
- (1) Non-forensic maintainenace division
 - (2) Forensic engineering division
 - (3) Non-forensic physical division
 - (4) Forensic physics divison
22. Polygraph is a :
- (1) a pictorial information of human
 - (2) a non-pictorial information of human
 - (3) a brain mapping
 - (4) a lie-detectors
23. DNA is found an everybody. Which of the following body materials cannot be used to isolate it ?
- | | |
|-----------|------------|
| (1) Semen | (2) Hair |
| (3) bone | (4) Vicera |



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24. Abrasion means :

- (1) loss and damages of deep layer of body wound
- (2) loss and damages of middle layer of body wound
- (3) loss and damages of deep epithelial layer of skin
- (4) loss and damages of superficial epithelial layer of skin

25. Black powder is a mixture of :

- (1) potassium nitrate, sulphur and charcoal
- (2) potassium citrate, sulphure and charcoal
- (3) potassium bromate, sulphuric acid and graphite
- (4) potassium chloride, hydrochloric acid and graphite

26. CD-RW is :

- (1) A compact disc to which data can not be written and stored
- (2) A compact disc to which data can be written and erased
- (3) A compact disc to which data can be recorded and stored
- (4) A compact disc to which data cannot be transferred

27. 'Dactyloscopy' is a science :

- | | |
|------------------------------|----------------------------|
| (1) Dealing with fingerprint | (2) Dealing with DNA |
| (3) Dealing with footprint | (4) Dealing with documents |

28. Decibel is the unit of :

- | | |
|------------------------|--------------------------|
| (1) Speed of light | (2) Radio wave frequency |
| (3) Intensity of sound | (4) Intensity of heat |

29. Fathom is the unit of :

- | | |
|---------------|--------------|
| (1) Sound | (2) Depth |
| (3) Frequency | (4) Distance |

30. Which prefix is often used with scientific terms to indicate that something is the same, equal or constant ?
- (1) Iso (2) Mega
(3) Meta (4) Quasi
31. The study of phenomenon at a very low temperature is called :
- (1) Heat transfer (2) Morphology
(3) Crystallography (4) Cryogenics
32. What percent of fire-related deaths are due to smoke inhalation rather than burns ?
- (1) 10% (2) 50%
(3) 80% (4) 99%
33. Pollination by birds is called :
- (1) Autogamy (2) Orthinophilly
(3) Entomophilly (4) Anemophilly
34. The per capita birth rate of a population is known as its :
- (1) Mortality (2) Natality
(3) Population density (4) Carrying capacity
35. Which of the following is primarily composed of calcium carbonate ?
- (1) Fish scales (2) Shark teeth
(3) Oystershells (4) Whale bones
36. Water flows through a horizontal pipe at a constant volumetric rate. At a location where the crosssectional area decreases, the velocity of the fluid :
- (1) Increases (2) Decreases
(3) Stays the same (4) Reduces to half



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- 37.** The most serious environmental pollution from a nuclear reactor is :
- (1) Radioactivity (2) Particulate formulation
(3) Thermal pollution (4) Noise pollution
- 38.** The process by which a substance absorbs moisture upon exposure to the atmosphere is called ;
- (1) Efflorescence (2) Deliquescence
(3) Dehydrogenation (4) Desalination
- 39.** A temperature of 295 K is equivalent to approximately :
- (1) 0 degrees Fahrenheit (2) 32 degrees Fahrenheit
(3) 72 degrees Fahrenheit (4) 97 degrees Fahrenheit
- 40.** The statue of Liberty is green because of :
- (1) Green stone (2) Oxidised brass
(3) Steel painted green (4) Oxidised copper
- 41.** One metal dissolved in another is called :
- (1) an alloy (2) an assay
(3) a mineral (4) a ceramic
- 42.** Which of the following contains carbohydrates the most ?
- (1) Barley (2) Maize
(3) Wheat (4) Rice
- 43.** Alcoholic fermentation is characteristic of :
- (1) Virus (2) Algae
(3) Yeasts (4) Bacteria

44. Which of the following substance is produced during photosynthesis ?
(1) Fat (2) Carbohydrate
(3) Amino Acid (4) Protein
45. Two objects that lose the same weight in water must have the same :
(1) Weight in air (2) Weight in water
(3) Density (4) Volume
46. Deficiency of which vitamin affects the ability to see in dim light ?
(1) A (2) C
(3) D (4) B₁₂
47. Which of the following is a contagious disease ?
(1) Small Pox (2) Typhoid
(3) Cholera (4) Beri-Beri
48. The substance that hardens when mixed with water is :
(1) Red "Lead (2) Gypsum Salt
(3) Epson Salt (4) Plaster of Paris
49. The heart of human-being :
(1) Rests while you sleep
(2) Never Rests
(3) Rests between beats
(4) Rests during period of stress
50. When a soap film on water is seen in day time, it shows beautiful colours. This phenomenon is due to :
(1) Diffraction (2) Refraction
(3) Polarisation (4) Interference

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- 51.** By fixation of nitrogen is meant :
- (1) Manufacture of nitrogen
 - (2) Liquefaction of nitrogen
 - (3) Conversion of nitrogen into nitric acid
 - (4) Conversion of atmospheric nitrogen into useful compounds
- 52.** Atoms of the same element i.e. having the same atomic number that differs in atomic weight, are called :
- (1) Isotopes
 - (2) Isomers
 - (3) Isobars
 - (4) Isohytes
- 53.** Joule is the unit of :
- (1) Temperature
 - (2) Energy
 - (3) Heat
 - (4) Pressure
- 54.** How many Dynes are there in one gram weight ?
- (1) 900
 - (2) 375
 - (3) 981
 - (4) 250
- 55.** Which substance is mixed to stiffer rubber ?
- (1) Sulphur
 - (2) Iron
 - (3) Calcium
 - (4) Magnesium
- 56.** Twinkling of stars is due to the effect of
- (1) Refraction of light
 - (2) Reflection of atmosphere
 - (3) Refraction of atmosphere
 - (4) Total Internal Reflection
- 57.** Which type of mirror is used while shaving ?
- (1) Concave mirror
 - (2) Convex mirror
 - (3) Plane mirror
 - (4) No specific mirror
- 58.** The process of formation of vapour from solid camphor is called
- (1) Freezing
 - (2) Evaporation
 - (3) Sublimation
 - (4) Condensation

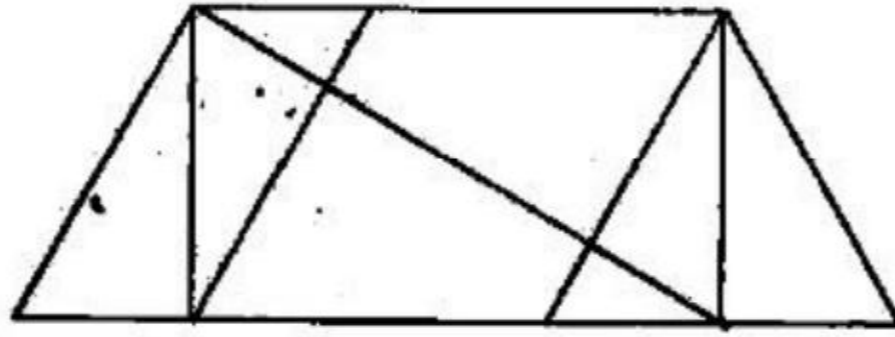
59. Atomes are composed of :

- (1) electrons and protons (2) electrons only
 (3) protons only (4) eletrons and nuclei

60. Epoxy resins are used as :

- (1) detergents (2) insecticides
 (3) adhesives (4) moth repellents

61. Find the numbers of triangles in the given figure :



- (1) 8 (2) 10 (3) 12 (4) 14

62. Look at this series : 7, 10, 8, 11, 9, 12, what number should come next ?

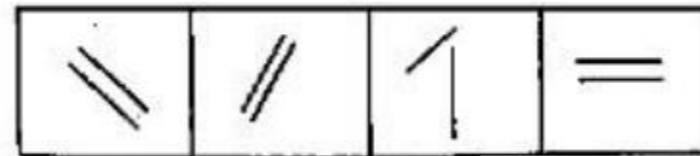
- (1) 7 (2) 10 (3) 12 (4) 15

63. Father is aged three times more than his son Ronit. After 8 years, he would be two and a half times of Ronit's age. After further 8 years, how many times would he be of Ranit's age ?

- (1) 2 times (2) $2\frac{1}{2}$ times
 (3) $2\frac{3}{4}$ times (4) 3 times

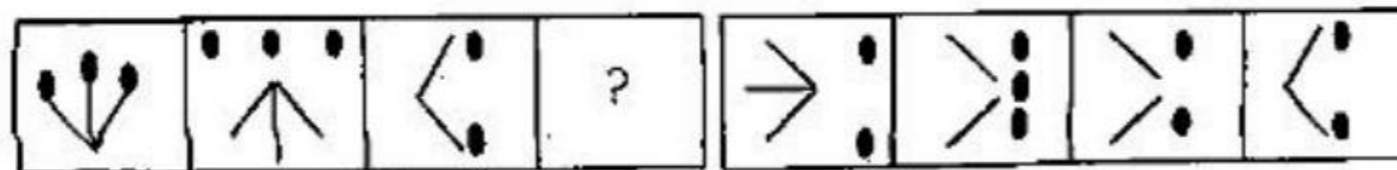
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64. Chose the figure which is different from the result :



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

65. Select a suitable figures from the Answer figure, that would replace the question mark :



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

66. Based on the following statements, which is the Correct conclusion drawn ?

Only gentlemen can become members of the club are officers,
Some of the officers have been invited for dinner :

- (1) All the members of the club have been invited for dinner
(2) Some of the officers are not gentlemen
(3) All gentlemen are members of the club
(4) Only gentlemen have been invited for dinner
67. If A is soln of Q, Q and Y are sisters, Z is the mother of Y, P is the son of Z, then which of the following statements is correct ?
- (1) P is the maternal uncle of A
(2) P and Y are sisters
(3) A and P are cousins
(4) None of the above

68. Marathon is to race as hibernation is to :
- (1) Winter (2) Bear (3) Dream (4) Sleep
69. A train running at the speed of 60 Km./hr. crosses a pole in 9 seconds. What is the length of the train ?
- (1) 120 metres (2) 180 metres
(3) 324 metres (4) 150 metres
70. In this series, you will be looking at both the letter pattern and the number pattern. Fill in blank in the middle of the series :
- SCD, TEF, UGH,, WKL
- (1) CMN (2) UJI (3) VIJ (4) IJT
71. Speed of the boat in still water is 9 Km./hr. It goes 12 Km. down stream and come back to the starting point in three hours. What is the speed of water in the stream ?
- (1) 3.5 Km./hr. (2) 3 Km./hr.
(3) 5 Km./hr. (4) 5.5 Km./hr.
72. Choose the alternative which is closely resembles the mirror image of the given combination ?
- ANS43Q12
- (a) ANS43Q12 (b) SIQEP2NA
(c) 2NAEP2SI (d) ISQEP2NA
- (1) a (2) b (3) c (4) d
73. Yard is to inch as quart is to :
- (1) Gallon (2) Ounce (3) Milk (4) Liquid



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74. Each problem consists of three statements. Based on the first two statements, the third statement may be true, false or uncertain:
- (a) Tanya is older than Eric
 - (b) Cliff is older than Tanya
 - (c) Eric is older than Cliff
- If first two statements are true, the third statement is :
- (1) True
 - (2) False
 - (3) Uncertain
 - (4) Can't say
75. Choose the word which is the exact OPPOSITE of the given word "ENORMOUS" ?
- (1) Soft
 - (2) Average
 - (3) Tiny
 - (4) Weak
76. Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is :
- (1) 9
 - (2) 11
 - (3) 13
 - (4) 15
77. If one-third of one-fourth of a number is 15, then three-tenth of that number is :
- (1) 35
 - (2) 36
 - (3) 45
 - (4) 54
78. A right triangle with sides 3cm, 4cm & 5cm is rotated the side of 3cm to form a cone. The volume of the cone so formed is :
- (1) $12\pi\text{ cm}^3$
 - (2) $15\pi\text{ cm}^3$
 - (3) $16\pi\text{ cm}^3$
 - (4) $20\pi\text{ cm}^3$
79. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through :
- (1) 145°
 - (2) 150°
 - (3) 155°
 - (4) 160°
80. In a four-day period Monday through thursday each of the following temporary office workers worked only one day, each a different day. Ms. Johnson was scheduled to work on Monday, but she traded with Mr. Carter, who was originally scheduled to work on wednesday. Ms. Falk traded with Mr. Kirk, who was originally scheduled to work on thursday. After all the switching was done, who worked on Tuesday ?
- (1) Mr. Carter
 - (2) Ms. Falk
 - (3) Ms. Johnson
 - (4) Mr. Kirk

SECTION - B
(BIOLOGY)

- 81.** Diatoms belongs to the group :
- | | |
|-------------|-------------------|
| (1) Algae | (2) Fungi |
| (3) Lichens | (4) Cyanobacteria |
- 82.** Which of the following plant causes allergy and hay fever :
- | | |
|------------------------------|-------------------------------------|
| (1) <i>Argemone mexicana</i> | (2) <i>Panthenium hysterophones</i> |
| (3) <i>Jatropha curcas</i> | (4) <i>Nerium indicum</i> |
- 83.** Caruncle is found in the seeds of :
- | | |
|--------------------|-------------------|
| (1) <i>Nerium</i> | (2) <i>Datura</i> |
| (3) <i>Ricinus</i> | (4) <i>Litchi</i> |
- 84.** Reserpene drug is extracted from :
- | | |
|---------------------------------|-----------------------------|
| (1) <i>Atropa belladonna</i> | (2) <i>Ricinus Communis</i> |
| (3) <i>Rauvoffia Serpentina</i> | (4) <i>Tagetes erecta</i> |
- 85.** Which of the following drug is used for treatment of Pulmonary problems ?
- | | |
|--------------|---------------|
| (1) Nicotine | (2) Abrin |
| (3) Ricin | (4) Ephedrine |
- 86.** Velamen is found in the roots of :
- | | |
|--------------------|------------------|
| (1) Mangroves | (2) Orchids |
| (3) <i>Cuscuta</i> | (4) <i>Cycas</i> |
- 87.** Perisperm in seeds develop from :
- | | |
|--------------|----------------|
| (1) Nucellus | (2) Funicle |
| (3) Hilum | (4) Ovary wall |

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88. Transgenic golden rice is enriched with :

- (1) Glutenin
- (2) Methionine
- (3) Vitamin A
- (4) All the essential amino acids

89. Primary Precursor of I.A.A. is :

- (1) Leucine
- (2) Tryptophan
- (3) Methionine
- (4) Aspartic acid

90. Circinotropoids ovale is found in :

- (1) *Opuntia*
- (2) *Raphanus*
- (3) *Crotalaria*
- (4) *Polygonum*

91. Find the false statement with regards to Asteraceas :

- (1) Epigynous Flower
- (2) Syngenesious authers
- (3) Cypsella fruits
- (4) Axile placentation

92. Coir is obtained from :

- (1) *Cocos nucifera*
- (2) *Crotalaria juncea*
- (3) *Gossypium arboreum*
- (4) *Agave americana*

93. Which ecological pyramid is always upright :

- (1) Pyramid of number
- (2) Pyramid of biomass
- (3) Pyramid of energy
- (4) Pyramid of number and pyramid of biomass

94. Which of the following enzymes is active above 90°C ?

- (1) ATP Synthetase
- (2) Taq Polymerase
- (3) Peroxidase
- (4) Lipase

95. Incomplete dominance is found in :
- | | |
|--------------------|----------------------|
| (1) <i>Solanum</i> | (2) <i>Mirabilis</i> |
| (3) <i>Iberis</i> | (4) <i>Pisum</i> |
96. Total number of hot spots of biodiversity in India is :
- | | |
|----------|----------|
| (1) Two | (2) Four |
| (3) Five | (4) Ten |
97. First transgenic crop was :
- | | |
|-------------|-------------|
| (1) Tobacco | (2) Brinjal |
| (3) Rice | (4) Pea |
98. Capsule of fern Eporangium burst at :
- | | |
|--------------|-------------|
| (1) Annulus | (2) Stomium |
| (3) Placenta | (4) Romenta |
99. Insectivorous plants grow in the soil deficient in :
- | | |
|---------------|--------------|
| (1) Magnesium | (2) Calcium |
| (3) Water | (4) Nitrogen |
100. Molecular scissor used in genetic engineering is :
- | | |
|--------------|-----------------------------|
| (1) Ligase | (2) Restriction endonucleus |
| (3) Catalase | (4) Peroxidase |
101. Labyrinthiform organs are found in :
- (1) *Anabas* and work as accessory respiratory organs
 - (2) *Clarias* and help in excretion
 - (3) Sharks and form skin covering
 - (4) *Labeo rohita* and act as current receptors

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102. In a shark fish, epibranchial arteries :

- (1) carry deoxygenated blood and supply it to gills
- (2) carry deoxygenated blood and supply it to dorsal aorta
- (3) carry oxygenated blood and supply it to gills
- (4) carry oxygenated blood and supply it to dorsal aorta

103. Deltoid ridge and acromion process are present in :

- (1) Femur and Pectoral girdle
- (2) Humerus and Pelvic girdle
- (3) Humerus and Pectoral girdle
- (4) Femur and Pelvic girdle

104. Anterior choroid plexus of brain :

- (1) Secretes cerebro-spinal fluid
- (2) Controls motor activity
- (3) Regulates salt balance in the body
- (4) Coordinates locomotion

105. Which of the following snake will possess broad belly scales, enlarged scales on the middle of back and very large fourth infra-labial scale ?

- (1) Cobra (2) Krait (3) Viper (4) Rat snake

106. Delicate hair like feathers having short calamus, long thread like rachis with few terminal barbs are known as :

- (1) Down feathers (2) Contour feathers
(3) Powder down feathers (4) Filoplume feathers

107. Organ of Jacobson is absent in adult :

- (1) *Columba* (2) *Sphenodon*
(3) *Naja* (4) *Hemidactylus*

108. Animal that shows Unguligrade locomotion is :

- (1) Bear (2) Dog (3) Deer (4) Primates

109. Parental care in *Alytes* is :

- (1) Shown by male that ties eggs on its back
- (2) Shown by female by keeping eggs in the mouth
- (3) Shown by both sexes by keeping eggs in abdominal brood pouch
- (4) Both parents guard eggs one after the other

110. Which of the following animals shows biradial symmetry ?

- | | |
|------------|-----------------|
| (1) Volvox | (2) Sea anemone |
| (3) Hydra | (4) Sycon |

111. Which one of the following animal is commonly called as 'hook-worm' ?

- | | |
|---------------------------------|------------------------------------|
| (1) <i>Ascaris lumbricoides</i> | (2) <i>Enterobius vermicularis</i> |
| (3) <i>Trichuris trichura</i> | (4) <i>Ancylostoma duodenale</i> |

112. Which class of mollusca has closed circulatory system ?

- | | |
|----------------|-----------------|
| (1) Pelecypoda | (2) Scaphopoda |
| (3) Gastropoda | (4) Cephalopoda |

113. Planula is a larval form of :

- | | |
|----------------|----------------|
| (1) Protozoans | (2) Cnidarians |
| (3) Molluscs | (4) Nematodes |

114. Excretory organ of *Limulus* is :

- | | |
|------------------------|------------------|
| (1) Malpighian tubules | (2) Nephridia |
| (3) Coxal glands | (4) Green glands |

115. Pseudocoelom is :

- (1) A body cavity lined with endoderm
- (2) A body cavity completely lined with mesoderm.
- (3) A body cavity whose inner edge is lined by endoderm while outer edge is lined by mesoderm
- (4) None of the above

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116. Which of the following is **not** a major factor in the success of the Arthropoda ?

- (1) Highly developed sensory organs
- (2) A chitinous exoskeleton
- (3) Segmentation and appendages
- (4) Open circulatory system

117. Annelids are also called as :

- (1) Flatworms
- (2) Thread worms
- (3) Bristle worms
- (4) Whipworms

118. *c l B* technique in *Drosophila* is used to detect :

- (1) autosomal recessive mutations
- (2) autosomal dominant mutations
- (3) sex linked recessive lethal mutations
- (4) sex linked dominant lethal mutations

119. If a couple, husband having an X-linked dreadly disease and wife homozygous normal, seeks your advice regarding having children, what will be your advice out of the following ?

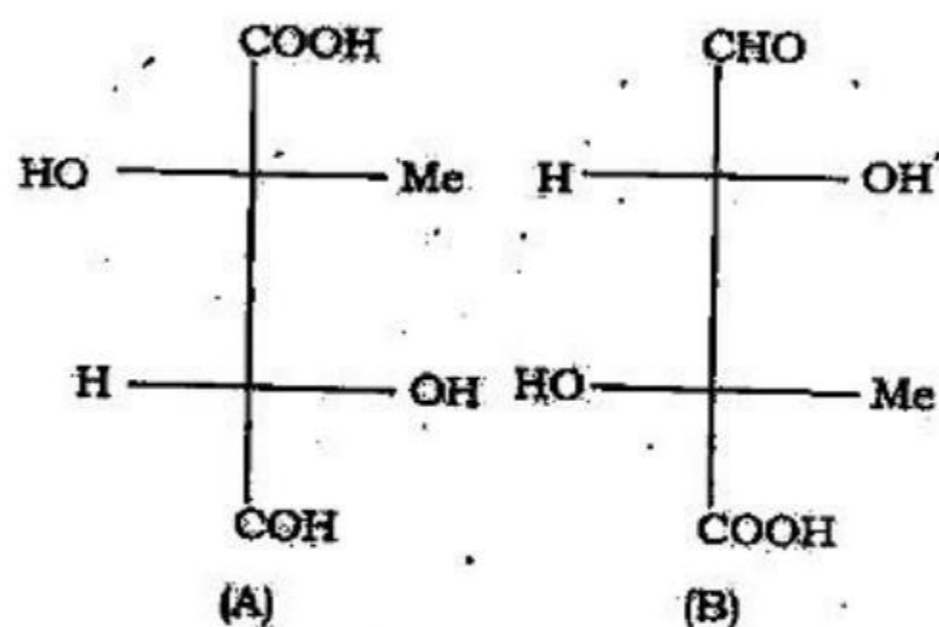
- (1) They will have 50% chance of having the affected male child
- (2) They can safely go for only female child
- (3) They can safely go for only male child
- (4) They should not plan to have a child

120. Segregation of alleles usually takes place at which phase of cell division ?

- (1) First anaphase of meiosis
- (2) Anaphase of mitosis
- (3) Pachytene
- (4) Diplotene

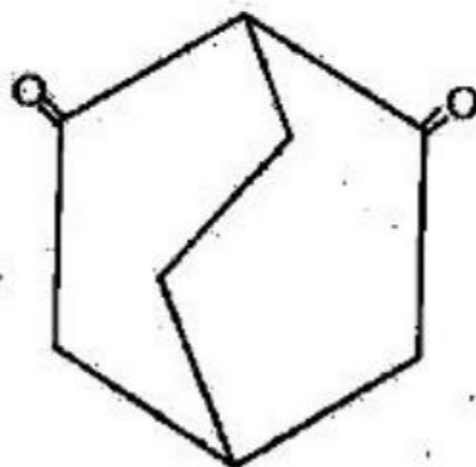
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121. Compound A and B are :



- | | |
|-------------------|---------------|
| (1) Enantiomers | (2) Epimers |
| (3) Diastereomers | (4) Identical |

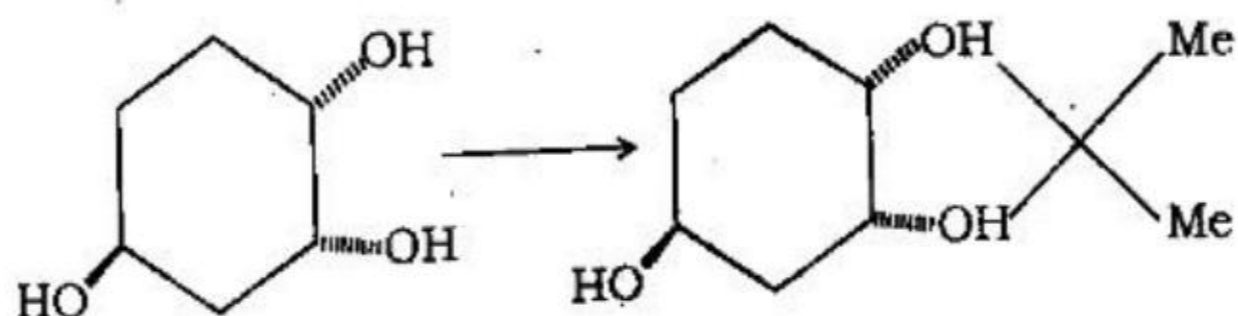
122. The IUPAC name of the compound given below is :



- (1) Bicyclo [2,2,0] octa -2,6-diene
- (2) Bicyclo [1,1,1] octanone
- (3) Bicyclo [2,2,2] - octa -2,5-dione
- (4) Bicyclo [2,2,1] - octa -2,5- dione

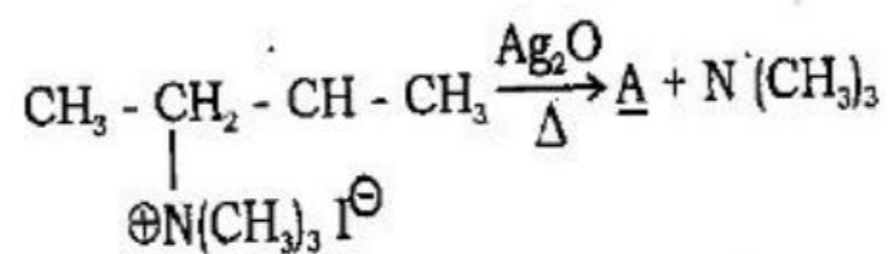
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123. A suitable reagent combination for carrying out the following conversion is :



- (1) Triethyl orthoacetate and p-toluene sulfonic Acid
- (2) 2-methoxypropene and sodium hydroxide
- (3) Trimethylorthoacetate and sodium hydroxide
- (4) 2-methoxypropene and p-toluene sulfonic Acid

124. The major product (A) in the reaction given below, is :

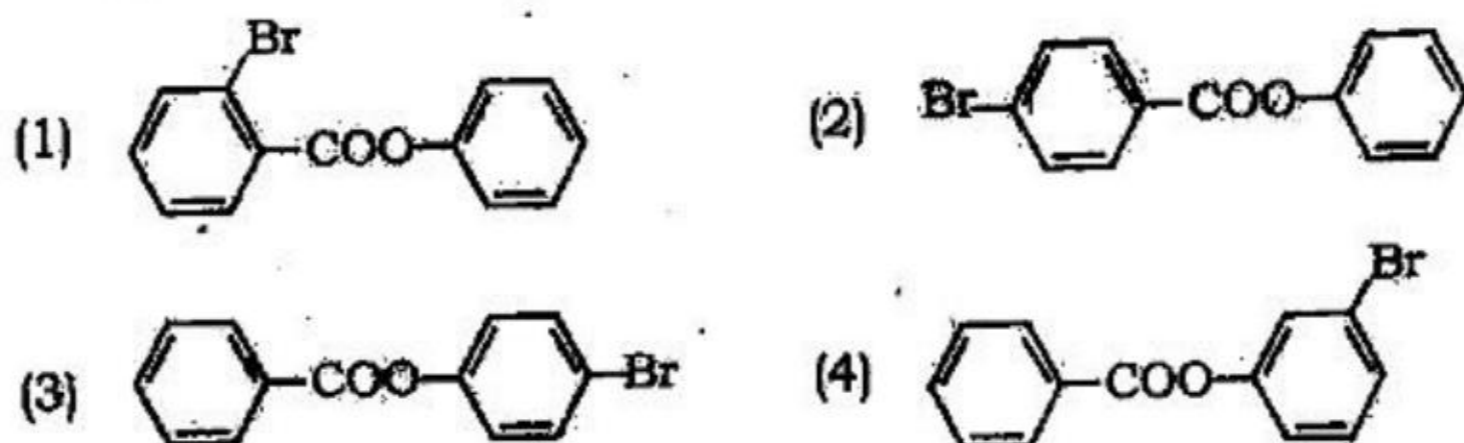


- | | |
|------------------|--------------------|
| (1) 2-Iodobutane | (2) 1-Butene |
| (3) cis-2-Butene | (4) trans-2-Butene |

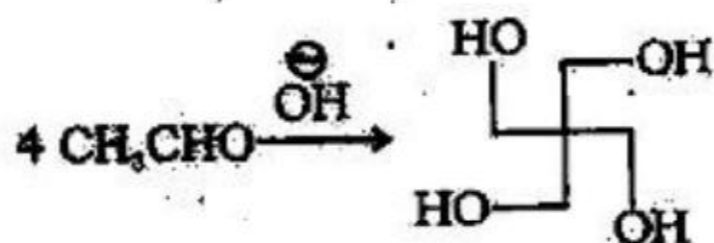
125. Benzene ring substituent is deactivating, but O/P - directing :

- | | |
|--|-----------------------|
| (1) -N=O | (2) -OCH ₃ |
| (3) $-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$ | (4) -NO ₂ |

126. The major product obtained from the mono-bromination of Phenyl benzoate is :



127. In the given reaction,



the reaction sequence is :

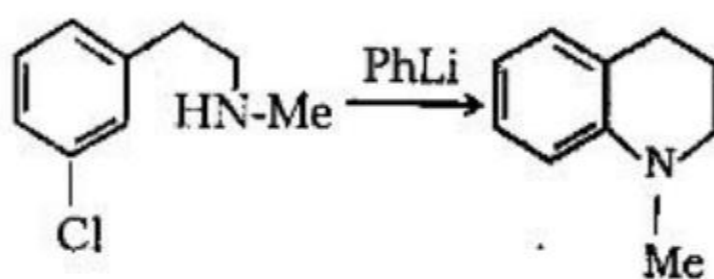
- (1) Two times Aldol reaction followed by Cannizzaro reaction
- (2) Two times Aldol reaction followed by Cannizzaro reaction
- (3) Cannizzaro reaction followed by Aldol reaction
- (4) Simple consecutive Aldol reactions.

128. The two reactions involved in the Robinson Annulation is :

- (1) Michael reaction followed by Perkin reaction
- (2) Hydroboration reaction followed by oppenauer oxidation
- (3) Diels-Alder reaction followed by Aldol reaction
- (4) Michael reaction followed by Aldol reaction

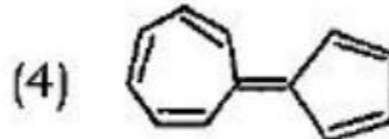
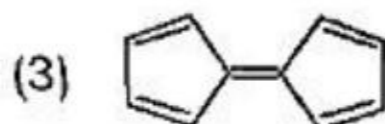
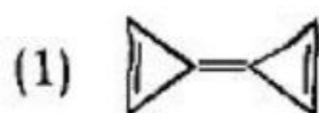
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129. The reaction given below involved :



- (1) Benzyne mechanism
- (2) Addition-Elimination mechanism
- (3) Concerted Mechanism
- (4) Free radical mechanism

130. Which of the following compound have the greatest resonance energy :



131. How many grams per milliliter of NaCl are contained in a 0.250M solution ?

- (1) 0.143 g/ml
- (2) 0.0146 g/ml
- (3) 0.0014 g/ml
- (4) 1.460 g/ml

132. The criteria for selection of a redox indicator is :

(1) $E < \frac{0.0591}{n}$

(2) $E > \frac{0.0591}{n}$

(3) $E = \frac{0.0591}{n}$

(4) $E = \frac{n \cdot 0.0591}{1}$

133. The salt of a weak acid is :

- (1) Neutral (2) Strong acid
(3) Strong base (4) Weak base

134. Which of the following reagents is used for the estimation of selective C-C cleavage ?

- (1) Karl-Fischer reagent (2) Chloramine-T
(3) Potassium Bromate (4) Periodic acid

135. The concentration of zinc ion is about 1ppm. This can be expressed as meq/L.:

- (1) 3.10×10^{-2} (2) 3.20×10^{-2}
(3) 3.30×10^{-2} (4) 3.06×10^{-2}

136. A 2.6g sample of plant tissue was analyzed and found to contain 3.6 μ g zinc. What is the concentration of zinc in the plant in ppb ?

- (1) 1400 ppb (2) 1200 ppb
(3) 1300 ppb (4) 1000ppb

137. The distribution ratio of weak acid in water is given by :

(1) $D = \frac{K_D}{\frac{K_a}{[H^+]} + 1}$

(2) $D = \frac{K_a}{\frac{K_D}{[H^+]} + 1}$

(3) $D < \frac{K_D}{\frac{K_a}{[H^+]} + 1}$

(4) $D > \frac{K_D}{\frac{K_a}{[H^+]} + 1}$



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138. The Van Deemter Equation is :

- (1) $HETP = A + \frac{B}{\bar{\mu}} + C\bar{\mu}$ (2) $HETP = B + \frac{A}{\bar{\mu}} + C\bar{\mu}$
(3) $HETP = C + \frac{A}{\bar{\mu}} + B\bar{\mu}$ (4) $HETP = A + \frac{C}{\bar{\mu}} + B\bar{\mu}$

139. The relation between A and T is :

- (1) $A = \log \frac{1}{T}$ (2) $A = \log T$
(3) $A = \log \% T$ (4) $A = \log 10 T$

140. The K_{sp} of AgCl is 1.0×10^{-10} . The concentrations of Ag^+ is :

- (1) 1.0×10^{-10} (2) 1.0×10^{-5}
(3) 1.0×10^{-4} (4) 1.0×10^{-3}

141. The temperature at which a real gas obeys the ideal gas laws over a wide range of pressure is :

- (1) critical temperature (2) boyle's temperature
(3) inversion temperature (4) reduced temperature

142. The rise of liquid in a capillary is due to :

- (1) viscosity (2) osmosis
(3) surface tension (4) diffusion

143. For coagulating Sb_2S_3 colloidal sol, which one of the following will have the lowest coagulation value ?

- (1) $AlCl_3$ (2) $BaCl_2$
(3) KCl (4) $NaCl$

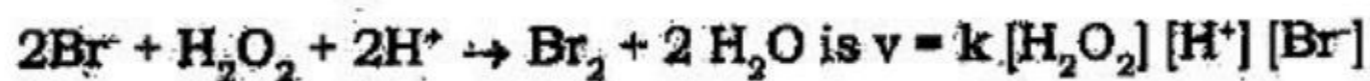
144. For the reaction $2\text{NO}(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons 2\text{NOCl}(\text{g})$

- (1) $k_p = k_c \times RT$ (2) $k_p = k_c / RT$
 (3) $k_p = k_c \times (RT)^2$ (4) $k_p = k_c / (RT)^2$

145. In a three component system the maximum number of degree of freedom can be :

- (1) 4 (2) 3 (3) 2 (4) 1

146. The rate equation for the oxidation of bromide ions by hydrogen peroxide in acid solution :



If the concentration of H_2O_2 is increased by a factor of 3, by what factor the rate of consumption of Br^- ions will be increased :

- (1) unaffected (2) 2
 (3) 3 (4) 4

147. 2.0 g of a solute X is distributed between 100 ml of water and 5 ml of CCl_4 . If the equilibrium amount of X in the aqueous layer is 0.5, the partition coefficient of X between CCl_4 layer and aqueous layer is :

- (1) 50 (2) 60 (3) 30 (4) 40

148. The isotope ${}^{214}_{84}\text{Po}$ undergoes one alpha and one beta particle emission sequentially to form an isotope X. The number of neutrons in X would be :

- (1) 82 (2) 83 (3) 127 (4) 210



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149. Which of the following statements is **not true** for chemisorption ?

- (1) Its magnitude increases with temperature
- (2) Very high order of heat is evolved in it
- (3) It is an irreversible process
- (4) It involves multi-molecular layer

150. Which of the following crystals will have the highest cohesive energy (or binding energy) ?

- | | |
|-----------------------|----------|
| (1) NaCl | (2) CsCl |
| (3) MgCl ₂ | (4) CaO |

151. The name of Alfred Werner is associated with :

- | | |
|------------------------------|----------------------------|
| (1) supramolecular chemistry | (2) coordination chemistry |
| (3) heterocyclic chemistry | (4) homogeneous catalysis |

152. Which of the following is a set of linear molecules/ions ?

- | | |
|---|---|
| (1) CO ₂ , NCS ⁻ and NO ₂ ⁺ | (2) CO ₂ , NCS ⁻ and NO ₂ |
| (3) NO ₂ , N ₃ ⁻ and NCS ⁻ | (4) ClO ₂ , CO ₂ and NO ₂ ⁺ |

153. Two isomers are known for Pt(NH₃)₂Cl₂. Which of the following structures are consistent with this observation ?

- (i) tetrahedral
(ii) planar
(iii) trigonal pyramidal
- | | |
|------------------|--------------------|
| (1) only (i) | (2) only (ii) |
| (3) (i) and (ii) | (4) (ii) and (iii) |

154. Consider the reaction in which a strong base M(OH)₃ is neutralized by a strong acid H₂X. What volume of 2 M base will be equivalent to 1 L of 3M acid ?

- | | | | |
|--------|-----------|---------|-----------|
| (1) 1L | (2) 1.5 L | (3) 2 L | (4) 0.7 L |
|--------|-----------|---------|-----------|

155. Complete the sentence : An octahedral complex, MA_4B_2

- (1) will have two constitutional isomers
- (2) will have two stereoisomers
- (3) can not show isomerism
- (4) will be optically active

156. What is the coordination number of a metal ion situated at the center of a square antiprism of ligand atoms ?

- (1) 2
- (2) 4
- (3) 6
- (4) 8

157. When ammonium hydroxide is added to an aqueous solution of copper sulphate, the colour of the solution becomes a deeper blue. The reaction taking place is best described as :

- (1) redox
- (2) rearrangement
- (3) addition
- (4) substitution

158. How many moles of $M_nO_4^-$ will be equivalent to one mole of Fe^{2+} in acid medium ?

- (1) 5 moles
- (2) 1/5 moles
- (3) 2 moles
- (4) 1/2 moles

159. A coordination complex was obtained in the form of two isomers both of which have octahedral coordination. No additional isomers could be isolated. Which among the following formulas is(are) consistent with this observation ? $[Cr(H_2O)_5Cl]$; $Cr(H_2O)_3Cl_3$; $Ni(NH_3)_4Cl_2$; $[NH_4]_2[NiCl_6]$

- (1) only $[Cr(H_2O)_5Cl]$
- (2) $Cr(H_2O)_3Cl_3$ and $[NH_4]_2[NiCl_6]$
- (3) $Cr(H_2O)_3Cl_3$ and $Ni(NH_3)_4Cl_2$
- (4) only $Ni(NH_3)_4Cl_2$



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160. How many moles of iodine will be equivalent to one mole of hydrogen peroxide in a redox reaction ?

(1) 1 mole

(2) $\frac{1}{2}$ mole

(3) 2 mole

(4) 4 mole

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166. If A is a 3×3 matrix with rank 2 and B is a 3×3 matrix with rank 3, then :

- (1) $\rho(AB) \leq 1$ (2) $\rho(AB) \leq 2$
(3) $\rho(AB) = 3$ (4) $\rho(AB) = 6$

167. If the roots of $x^2 - bx + c = 0$ are two consecutive integers, then $b^2 - 4c$ is :

- (1) 0 (2) 2
(3) 1 (4) none of these

168. If $a + b + c = 0$, then the quadratic equation $3ax^2 + 2bx + c = 0$ has

- (1) Imaginary roots
(2) at least one root in $[0, 1]$
(3) one root in $[2, 3]$ and other in $[-2, -1]$
(4) None of these

169. For what values of k, the following equations are inconsistent ?

$$\begin{aligned} 3x + 2y - 5z &= 3 \\ 5x - 4y - z &= 5 \\ 2x - 6y + kz &= 9 \end{aligned}$$

- (1) 0 (2) 10
(3) 4 (4) none of these

170. The solution of the differential equation $\frac{dy}{dx} = (4x + y + 1)^2$ is :

- (1) $4x + y + 1 = \tan(2x + c)$ (2) $4x + y + 1 = 2\tan(2x + c)$
(3) $2(4x + y + 1) = \tan(2x + c)$ (4) $\tan(4x + y + 1) = 2x + c$

171. Given that $\frac{dy}{dx} \cdot \frac{dx}{dy} = 1$. Which one of the following is always true ?

- (1) $\frac{d^2y}{dx^2} \cdot \frac{dy}{dx} + \left(\frac{dy}{dx}\right)^2 \frac{d^2x}{dy^2} = 0$ (2) $\frac{d^2y}{dx^2} \frac{dx}{dy} + \left(\frac{dy}{dx}\right)^2 \frac{d^2x}{dy^2} = 0$
 (3) $\frac{d^2y}{dx^2} \left(\frac{dy}{dx}\right)^2 + \frac{dy}{dx} \frac{d^2x}{dy^2} = 0$ (4) $\frac{d^2y}{dx^2} \frac{dx}{dy} + \frac{dy}{dx} \frac{d^2x}{dy^2} = 0$

172. The differential equation $(2x^2 + by^2) dx + cxy dy = 0$ is made exact by multiplying the integrating factor $1/x^2$. Then :

- (1) $2c = b$ (2) $c = b$
 (3) $2b + c = 0$ (4) $2c + b = 0$

173. The boundary value problem $\frac{d^2y}{dx^2} + y = 0$, $x \in [0, \pi]$, $y(0) = 0$, $y(\pi) = 0$ has :

- (1) Unique solution (2) Infinitely many solutions
 (3) No solution (4) Finitely many solutions

174. A differential equation $\frac{dy}{dx} = y \tan x - 2 \sin x$ has an integrating factor :

- (1) $\cos x$ (2) $e^{\int \tan x dx}$
 (3) $e^{-\int \sin x dx}$ (4) $e^{\int \cos x dx}$

175. The integrating factor of the differential equation $(x^2 + y^2 + 2x) dx + 2y dy = 0$ is :

- (1) e^x (2) $\log x$ (3) e^{xy} (4) ex^2

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176. The particular integral of $(D^2 - 2D)y = e^x \sin x$ is :

(1) $-\frac{1}{2}e^x \sin x$

(2) $e^x \cos y$

(3) $-\frac{1}{2}e^x \cos y$

(4) none of these

177. $\int_0^{\infty} \frac{\sin t}{t} dt$ equals to :

(1) 0

(2) π

(3) $\frac{\pi}{4}$

(4) $\frac{\pi}{2}$

178. The inverse laplace transform of $\frac{1}{s^2(s^2+1)}$ is :

(1) $t + \sin t$

(2) $1 - \sin t$

(3) $t - \sin t$

(4) $t + \cot t$

179. If the laplace transform of $y(t)$ is $y(s)$, then application of laplace transform in initial value problem $y'' + 9y = 6\cos 3t$, $y(0) = 2$, $y'(0) = 0$ gives that :

(1) $y(s) = \frac{2s^3 + 24s}{(s^2 + 9)^2}$

(2) $y(s) = \frac{5s^3 + 12s}{(s^2 + 9)}$

(3) $y(s) = \frac{s^2 + 18s}{(s^2 + 9)^2}$

(4) none of these

180. The inverse laplace transform of $\frac{s+1}{s^2+6s+25}$ is :

(1) $e^{-3t}(\cos 4t - \frac{1}{2} \cos 4t)$

(2) $e^{-3t}(\sin 4t - \frac{1}{2} \cos 4t)$

(3) $e^{-3t}(\cos 4t - \frac{1}{2} \sin 4t)$

(4) none of these

181. The integral equation $y(x) = \int_0^x (x-t)y(t) dt - x \int_0^1 (1-t)y(t) dt$ is equivalent to :

- (1) $y'' - y = 0, y(0) = 0, y(1) = 0$
 (2) $y'' - y = 0, y(0) = 0, y'(0) = 0$
 (3) $y'' + y = 0, y(1) = 0, y'(1) = 0$
 (4) $y'' + y = 0, y(0) = 0, y'(0) = 0$

182. The solution of the integral equation $g(s) = s + \int_0^1 su^2g(u) du$ is :

- (1) $g(t) = \frac{3t}{4}$ (2) $g(t) = \frac{4t}{3}$ (3) $g(t) = \frac{2t}{3}$ (4) $g(t) = \frac{3t}{2}$

183. Convert the following differential equation into an integral equation :

$$y'' + \lambda xy + f(x), y(0) = 1, y'(0) = 0 :$$

- (1) $y(x) = 1 + \int_0^x (x-t)[f(t) - \lambda ty(t)] dt$
 (2) $y(x) = 1 + \int_0^x (x-t)[2f(t) - \lambda t^2y(t)] dt$
 (3) $y(x) = 1 - \int_0^1 (x-t)[f(t) - \lambda ty(t)] dt$
 (4) none of these

184. The laplace transform of $\frac{\sin at}{t}$ is :

- (1) $\cot^{-1} \frac{2as}{s^2+a^2}$ (2) $\cot^{-1} \frac{s}{a}$
 (3) $\tan^{-1} \frac{s}{a}$ (4) $\tan^{-1} \frac{2as}{s^2+a^2}$

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185. The number of generators of a cyclic group of order 12 are :

- (1) 2 (2) 6 (3) 12 (4) 4

186. The number of 5-sylow subgroups of Z_{20} is :

- (1) 1 (2) 4 (3) 5 (4) 6

187. Which of the following cannot be the cardinality of a field ?

- (1) 4 (2) 6 (3) 7 (4) 27

188. What is the dimension of a vector subspace W of a vector space $\mathbb{R}^3(\mathbb{R})$, where $W = \{(a, b, c) : a + b = c\}$

- (1) 1 (2) 2
(3) 3 (4) none of these

189. Dimension of a vector space $\mathbb{C}^3(\mathbb{R})$ is :

- (1) 3 (2) 6
(3) 9 (4) none of these

190. Which of the following is not a linear transformation ?

- (1) $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$ defined by $T(x, y, z) = (x, z)$
(2) $T: \mathbb{R}^3 \rightarrow \mathbb{R}^3$ defined by $T(x, y, z) = (x, y - 1, z)$
(3) $T: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ defined by $T(x, y) = (2x, y - x)$
(4) $T: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ defined by $T(x, y) = (y - x)$

191. Newton's iterative formula to find \sqrt{N} is :

- (1) $x_{n+1} = x_n (2 - Nx_n)$ (2) $x_{n+1} = x_n (2 + Nx_n)$
(3) $x_{n+1} = 2 \left(x_n + \frac{N}{x_n} \right)$ (4) none of these

192. The number i^i is equal to :

- (1) 0 (2) 1
(3) $\frac{\pi}{2}$ (4) none of these

193. The complex number $\frac{1+2i}{1-2i}$ lies in the :

- (1) I quadrant (2) II quadrant
(3) III quadrant (4) IV quadrant

194. Let $A = \begin{bmatrix} 0 & \omega \\ \omega & 0 \end{bmatrix}$, where ω is a complex cube root of unity. Then A^{24} is :

- (1) A^2 (2) A
(3) Zero matrix (4) Identity matrix

195. The sum of the infinite series $\frac{2}{3!} + \frac{4}{5!} + \frac{6}{7!} + \frac{8}{9!} + \dots \infty$ is :

- (1) e (2) $2e$ (3) $\frac{1}{e}$ (4) $\frac{3e}{2}$

196. If $\frac{1}{\log_a x} + \frac{1}{\log_c x} = \frac{2}{\log_b x}$, then a, b, c are in :

- (1) H.P. (2) A.P. (3) G.P. (4) None of these

197. If f is twice differentiable function such that $f''(x) = -f(x)$, $f(x) = g(x)$ and $h(x) = [f(x)]^2 + [g(x)]^2$. If $h(5) = 11$ then $h(10)$ is equal to :

- (1) 22 (2) 16
(3) 121 (4) none of these

198. The sum of the series : $1 + \frac{2}{1.2.3} + \frac{2}{2.3.4} + \frac{2}{3.4.5} + \frac{3e}{2} + \dots$ is :

- (1) 2 (2) $\frac{3}{2}$
(3) $\log 2$ (4) $\log 2 - \frac{1}{2}$

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199. If $f(x)$ is differentiable in $[a, a + h]$, there exists at least one real number θ such that :

$$f(a + h) - f(a) = h f'(a + \theta h).$$

Then θ has the value :

(1) $\theta = 1$

(2) $\theta = 0$

(3) less than θ

(4) none of these

200. The asymptote of the curve $r\theta = a$ is :

(1) $r \sin \theta = a$

(2) $r = a \sin \theta$

(3) $r = a \cos \theta$

(4) $r \cos \theta = a$

SECTION - B

(PHYSICS)

201. If the kinetic energy of a free electron doubles, its de Broglie wavelength changes by the factor :

- (1) 2 (2) $1/2$ (3) $\sqrt{2}$ (4) $1/\sqrt{2}$

202. If the critical angle for total internal reflection from a medium to vacuum is 30° . Then velocity of light in the medium is :

- (1) 1.5×10^8 m/s (2) 2.5×10^8 m/s
(3) 3.8×10^8 m/s (4) 5.5×10^8 m/s

203. An ideal black body is represented by :

- (1) A metal coated with a black dye
(2) A glass surface coated with coal tar
(3) A hollow enclosure blackened from inside and having a small hole
(4) A lump of charcoal heated to a high temperature

204. Out of the following, which one is **not** an example of capillary action ?

- (1) Ploughing of the field
(2) Absorption of ink in a blotting paper
(3) floating of wood on the surface of water
(4) Rise of oil in the wick of a lamp

205. At what temperature, the rms speed of gas molecules is half the value at NTP ?

- (1) 68.25 K (2) 273 K (3) 345 K (4) 0 K

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206. The velocity of sound in any gas depends upon :

- (1) Wavelength of sound only
- (2) Density and elasticity of gas
- (3) Intensity of sound waves only
- (4) Amplitued and frequency of sound

207. The escape velocity for a body on the earth is 11.2 km/s. If the radius of the earth is increased 4 times, then the escape velocity would be :

- (1) 44.8 km/s
- (2) 33.8 km/s
- (3) 25.7 km/s
- (4) 22.4 km/s

208. If dQ is the amount of heat supplied and dW is the work done, then in isothermal process :

- (1) $dQ + dW = 0$
- (2) $dQ - dW = 0$
- (3) $dW/dQ = 0$
- (4) none of the above

209. A capacitor has a capacitive reactance of 400Ω when connected to a 100 v, 25 Hz supply. The value of capacitance is :

- (1) 15.92 μF
- (2) 57.34 μF
- (3) 92.04 μF
- (4) 23.12 μF

210. In a gas the transport of momentum gives rise to the phenomenon of :

- (1) Viscosity
- (2) Conduction
- (3) Diffusion
- (4) Volume

211. A decrease in the Helmholtz function of a system is equal to :

- (1) Change in temperature
- (2) External workdone
- (3) Change in internal energy
- (4) All of the above

212. A body of mass m is suspended from a spring fo force constant k . The maximum distance up to which the body can be pulled down for the oscillation to remain harmonic is :

- (1) $2 mg/k$
- (2) mg/k
- (3) $2k/mg$
- (4) k/mg

213. A process 'A' is irreversible and adiabatic. Process 'B' is reversible and adiabatic. The entropy change in process 'A' and process 'B', respectively are :

- (1) Zero and positive (2) Zero and negative
 (3) Negative and zero (4) Positive and zero

214. In terms of magnetic properties, Oxygen belongs to ?

- (1) Magnetic materials (2) Ferromagnetic materials
 (3) Paramagnetic materials (4) Diamagnetic materials

215. The current at resonance in a series L-C-R circuit is 0.2 mA. If the applied voltage is 250 mV at a frequency of 100 kHz and the circuit capacitance is $0.04 \mu\text{F}$, the value of circuit inductance is :

- (1) $63.3 \mu\text{H}$ (2) $24.4 \mu\text{H}$ (3) $12.7 \mu\text{H}$ (4) $34.9 \mu\text{H}$

216. For a given material, the Young's modulus is 2.4 times that of rigidity modulus. Its Poisson's ratio is :

- (1) 2.4 (2) 1.2 (3) 0.4 (4) 0.2

217. Which one of the following phenomenon shows particle nature of light :

- (1) Polarization (2) Photoelectric effect
 (3) Interference (4) Refraction

218. The temperature of a furnace is 2327°C and the intensity is maximum in its radiation spectrum at 1200 \AA . If the intensity in the spectrum of a star is maximum at 4800 \AA , then the surface temperature of the star is :

- (1) 650°K (2) 600°K (3) 480°K (4) 750°K

219. Stars appear to move from east to west because :

- (1) All stars move from east to west
 (2) The earth rotates from west to east
 (3) The earth rotates from east to west
 (4) The background of the stars moves from west to east

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220. The impurity with which pure silicon should be doped to make a p-type semiconductor is :

- (1) Phosphorus (2) Boron
(3) Antimony (4) Arsenic

221. Light Emitting Diode (LED) converts :

- (1) Light energy into electrical energy
(2) Electrical energy into light energy
(3) Thermal energy into light energy
(4) Mechanical energy into electrical energy

222. Pascal is the unit for :

- (1) Thrust (2) Pressure
(3) Frequency (4) Conductivity

223. Sound waves in air are :

- (1) Transverse (2) Longitudinal
(3) Electromagnetic (4) Polarised

224. When a red glass is heated in dark room, it will seem :

- (1) Black (2) Green (3) Yellow (4) Red

225. If the spinning speed of the earth is increased, then the weight of the body at the equator :

- (1) Increases (2) Decreases
(3) Doubles (4) Does not change

226. A body of mass 10g is set to rotate in a circular path by means of a string 200 cm long. If it makes 3 complete revolution in 2s, find the tension of the string :

- (1) 1.77 N (2) 9.65 N (3) 3.45 N (4) 7.36 N

227. Which one of the following pair of rays is electromagnetic in nature :

- (1) Alpha rays and X-rays (2) Alpha rays and cosmic rays
(3) Infrared rays and beta rays (4) Infrared rays and X-rays

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ROUGH WORK

रफ़ कार्य

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P.T.O.



अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली-काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में लिफाफा रहित प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा। केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।
4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।
5. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।
6. ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्नपुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्नपुस्तिका पर अनुक्रमांक और ओ० एम० आर० पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।
7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।
9. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।
10. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो संबंधित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।
11. रफ कार्य के लिए प्रश्न-पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा उत्तर-पुस्तिका के अंतिम पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त केवल ओ एम आर उत्तर-पत्र परीक्षा भवन में जमा कर दें।
13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।

