PGEN

Total Marks : 100
Time : 100 Minutes

Candidate's Seat No. :

Question Booklet Code : **A**

A
Seal Sticker

Candidate's Signature _____   Block Supervisor's Signature _____

DO NOT OPEN QUESTION BOOKLET UNTIL INSTRUCTED.

INSTRUCTIONS FOR CANDIDATE:

1. Check Number printed on your OMR SHEET and Question Paper with your SEAT No. before answering the questions. Consult block supervisors in case the above mentioned numbers do not match with your seat number.

2. There are total 100 questions. For answer of each question A, B, C, D, E options are given in OMR SHEET. In OMR SHEET, there is "E" option. "E" option is for "Not Attempted". If candidate do not wish to answer the question he/she should select "E" option (Not Attempted). All questions are compulsory.

   For Example:

   Which state of India has the longest sea shore ?

   A ◯   B ◯   C ●   D ◯   E ◯

   (A) Maharashtra   (B) Tamilnadu

   (C) Gujarat (D) Andhra Pradesh

   In this example, the right answer is (C). Therefore, the Circle of (C) has been darkened (encoded). Candidate should not give the answer "Gujarat" in writing.

   The options once darkened/answered by candidate cannot be changed.

3. Candidates are not permitted to leave examination hall during examination.

4. Candidates must strictly enter SEAT NO. in the designated space provided in OMR SHEET as well as Question Paper neatly as soon as they receive the OMR SHEET & Question Paper.

5. Candidates must not write name or put any identification sign/symbol on OMR SHEET. In such case strict disciplinary action will be taken against candidate & will be considered disqualified/ineligible. Only Seat No. must be entered at designated space provided in OMR SHEET.

6. Both, Candidate's & Supervisor's signature must be done on Certificate of OMR SHEET. Unsigned OMR SHEET would not be considered for evaluation.

7. Candidates are not permitted to use or carry with them any kind of literature, guide, hand written notes, or printed books, mobile phone, pagers, smart watches, camera or any electronic gadgets to examination hall.

8. Use of only Non-scientific / Non-programmable calculator shall allow during examination.

9. Candidates are not permitted to talk/discuss in the Examination Hall. Any candidate found violating supervisor's instructions will be disqualified.

10. Candidates must fully darken circle A, B, C, D and E accordingly with Blue / Black ball pen. If answers are marked with any other coloured ball pen, pencil, white ink (whitner), any corrections are done by candidate by means of blade or rubber or whitner will not be considered for evaluation.

11. Candidates may carry QP with them after Examination.

12. **For correct answer 1 (One) marks will be given.**

    If candidate gives more than one option as answer for one question in answer sheet (OMR SHEET), or gives wrong answer then the candidate will be allotted Zero (0) marks.

    If candidate does not want to answer a particular question and marks (E) or leave the option without encoding on OMR sheet, then no minus marks will be given.

Submit the OMR SHEET to the block supervisor after completion of examination without fail before leaving examination hall, failure to do so will result in disqualification of the candidature for the examination and disciplinary action will be taken against such candidate.

1. Which of the following detector is used for analysis of chlorinated solvents after extraction from water in gas chromatography?

(A) Thermal conductivity detector

(B) Flame ionization detector

(C) Electrical conductivity detector

(D) None of the above

2. Detection limit of copper as per standard methods using Inductively coupled plasma Spectroscopy is:

(A) 0.1 µg/L

(B) 1 µg/L

(C) 5 µg/L

(D) 6 µg/L

3. Instrument which is used to sort out charged gas molecules or ions according to their masses is called

(A) Gas chromatograph

(B) Liquid chromatograph

(C) Spectrophotometer

(D) Mass spectrometer

4. How much acidic is a water sample of 4 pH compared to a sample of 6 pH?

(A) 2 times

(B) 20 times

(C) 100 times

(D) 0.01 times

5. Which type of acidity will not be present in a sample having pH 7.5?

(A) Phenolphthalein Acidity

(B) Mineral Acidity

(C) No Acidity

(D) Carbon dioxide acidity

6. If Phenolphthalein alkalinity of a given sample is 120 mg/L and hydroxide alkalinity of the same sample is 80 mg/L, what would be the Carbonate alkalinity of the sample?

(A) 80 mg/L

(B) 40 mg/L

(C) 200 mg/L

(D) 120 mg/L

7. When alkalinity of a water sample is less than total hardness, which of the following relation is true?

(A) Carbonate hardness = Total hardness

(B) Carbonate hardness = alkalinity

(C) Carbonate hardness > alkalinity

(D) Carbonate hardness < alkalinity

8. Which of the following reagent/compound is used to avoid interference of nitrate in determination of dissolved oxygen?

(A) Manganese Sulphate

(B) Sodium Hydroxide

(C) Potassium Iodide

(D) Sodium Azide

9. If initial DO of the wastewater sample was found to be 8 mg/L and final DO of the sample was found to be 3 mg/L. What will be the BOD of the sample if dilution factor is 5% assuming that unseeded dilution water was used for the test.

(A) 300 mg/L

(B) 220 mg/L

(C) 100 mg/L

(D) 180 mg/L

10. The relation between Ultimate BOD (L_0) and Theoretical oxygen demand value (O_{th}) is:

(A) $L_0 > O_{th}$

(B) $L_0 < O_{th}$

(C) $L_0 = O_{th}$

(D) $L_0 = 0.5 O_{th}$

11. Which of the following quality parameter of water is usually determined by gravimetric analysis?

(A) Solids

(B) Hardness

(C) Nitrate

(D) Chlorides

12   **Crown corrosion in concrete sewers is caused due to presence of:**

(A) Nitrates in sewage   (B) Iron in sewage

(C) Phosphorous in sewage   (D) Sulphates in sewage

13.   **Volatile acids are normally expressed in mg/L as:**

(A) Formic Acid   (B) Acetic Acid

(C) Propanic Acid   (D) Butyric Acid

14.   **Part 1 of Code of practice for ancillary structures in sewerage system (IS 4111-1986, Reaffirmed:2001) provides guidelines related to:**

(A) Flushing Tanks   (B) Inverted syphon

(C) Pumping station and pumping mains (D) Manholes

15.   **The design technique adopted in design of large water supply networks, as an aid to simplify and separate the smaller loops is:**

(A) Equivalent pipe method   (B) Hardy cross method

(C) Circle method   (D) Electrical analyser method

16.   **The type of distribution network suitable for a city having well planned roads and divided in to uniform sectors but without a ring road is:**

(A) Dead end system   (B) Grid Iron system

(C) Ring system   (D) Tree system

17.   **The treatment method which is used for removal of undesirable gases from the water is:**

(A) Disinfection   (B) Filteration

(C) Softening   (D) Aeration

18.   **1 mg/L of Hydrogen ion released during coagulation neutralizes:**

(A) 1 mg/L   (B) 2 mg/L

(C) 0.5 mg/L   (D) 0.1 mg/L

19.   **The optimum pH for $CaCO_3$ precipitation by lime addition is from:**

(A) 9-9.5   (B) 11-12

(C) 5-6   (D) 6-7

20.   **As per manual on water supply and treatment systems Part A (March 2024), the design period for the weir used for storage of water should be:**

(A) 15 years   (B) 30 years

(C) 50 years   (D) 75 years

21.   **The standard rate of filtration for a conventional rapid sand filter as per manual on water supply and treatment systems Part A (March 2024) is:**

(A) 4.8-6.0 $m^3/m^2/hr$ (B) 2.5-3 $m^3/m^2/hr$

(C) 1.5-2 $m^3/m^2/hr$ (D) 10-12 $m^3/m^2/hr$

22.   **In a water supply scheme involving surface water as a source, the total losses (Headwork + WTP + Distribution) should not exceed:**

(A) 10%   (B) 11%

(C) 15%   (D) 25%

23.   **The treatment train which should be adopted for raw water having a turbidity of 30 NTU, ignoring other parameters is:**

(A) Aeration-PST-Clariflocculator-RSF-Chlorination

(B) Aeration-PST-Chlorination

(C) PST-Chlorination

(D) RSF-Chlorination

---

24. **Detention time adopted for the design of flocculator used for water treatment is:**

(A) 1-2 mins   (B) 45-50 mins

(C) 10-40 mins   (D) 60-120 mins

25. **Methemoglobinemia in infants is caused by presence of excess:**

(A) Chlorides   (B) Fluorides

(C) Nitrates   (D) Lead

26. **As per IS 10500:2012, the maximum perminssbile concentration of Iron (Fe) is :**

(A) 0.1 mg/L   (B) 0.3 mg/L

(C) 5 mg/L   (D) 0.05 mg/L

27. **The hardness cause due to presence of excess sodium ions in water is called**

(A) Temporary Hardness   (B) Permanent Hardness

(C) Total Hardness   (D) Pseudo Hardness

28. **For a flow of 2 m^3/s, the plan area of a rectangular sedimentation tank to remove all the particles having settling velocity of 0.02 m/s is:**

(A) 100 m^2 (B) 200 m^2

(C) 50 m^2 (D) 400 m^2

29. **In disinfection, which of the following form of chlorine is most effective in killing the pathogenic bacteria ?**

(A) Cl   (B) OCl

(C) HOCl   (D) NH_2Cl

30. **The organism, which exhibits very nearly the characteristics of an ideal pathogenic indicator is :**

(A) Entamoeba histolytica   (B) Salmonella typhi

(C) Escherichia coli   (D) Vibro comma

31. **A water sample has a pH of 9.25. The concentration of hydroxyl ion in the water in mg/L would be:**

(A) $10^{-9.25}$ (B) $10^{-4.75}$

(C) 3.020   (D) 0.302

32. **The adsorbent most commonly used in water and wastewater treatment is:**

(A) Sand   (B) Activated Carbon

(C) Coal-tar   (D) Ordinary wood savings

33. **$BOD_{(5,20)}$ of an textile wastewater sample was found to be 350 mg/L, what would be its ultimate BOD? (Roundup the answer)**

(A) 415 mg/L   (B) 512 mg/L

(C) 239 mg/L   (D) 162 mg/L

34. **If two streams of wastewater originating from two different processes in an industry is having following characteristics, what will be the BOD of the wastewater of the mixture if both are mixed in the equalization tank?**

Stream 1: BOD=340 mg/L, Volume= 10000 Litre

Stream 2: BOD=110 mg/L, Volume=24000 Litre

(Roundup the answer)

(A) 225 mg/L   (B) 450 mg/L

(C) 178 mg/L   (D) 118 mg/L

35. **Which one of the following is the correct sequence of stages for anaerobic digestion of sludge:**

(A) Hydrolysis → Acidogenesis → Methanogenesis

(B) Acidogenesis → Hydrolysis → Methanogenesis

(C) Methanogenesis → Hydrolysis → Acidogenesis

(D) Complex sludge → Acidogenesis → Hydrolysis

36. **The method of population forecasting which is more suitable to a growing town having lot of scope of expansion is:**

(A) Arithmetical increase method   (B) Geometrical increase method

(C) Decreasing rate of growth method   (D) Graphical extension method

37. **As per Darcy-Weisbach's Formula, head loss in the pipe is proportional to**

(A) Cube of Velocity   (B) Square of velocity

(C) Square root of velocity   (D) Cube root of velocity

38. **The valve which is provided to prevent back flow in the pumping mains when the pumps are shut down:**

(A) Scour valve   (B) Needle and cone valve

(C) Air inlet valve   (D) Reflux valve

39. **Which one of the following cannot be considered as a cleaner production option for an industry?**

(A) Good house keeping   (B) Process Change

(C) On-site waste disposal   (D) Product modification

40. **If the sulphate concentration in drinking water is 250 mg/L, what will be its concentration in ppm (Parts per million)**

(A) 0.250   (B) 250000

(C) 250   (D) 2500

41. **The residue which remains after total solids are ignited at $500 \pm 50°C$ in determination of solids for wastewater:**

(A) Total suspended solids   (B) Total volatile solids

(C) Total solids   (D) Total fixed solids

42. **Which of the following is not a physical unit operation used for wastewater treatment?**

(A) Screening   (B) Coagulation

(C) Flow equalization   (D) Grit removal

43. **The type of settling which usually occurs in lower layers of a deep solids or biosolid mass, such as in the bottom of deep secondary settling facilities and in solids-thickening facilities:**

(A) Hindered settling   (B) Flocculent settling

(C) Compression settling   (D) Discrete settling

44. **Which of the following is the correct sequence of the electrochemical oxidation potential (V), for the different oxidizing agents?**

(A) Ozone > Chlorine > Hydrogen peroxide > Hydroxyl radical

(B) Ozone > Hydrogen peroxide > Chlorine > Hydroxyl radical

(C) Hydroxyl radical > Ozone > Hydrogen peroxide > Chlorine

(D) Chlorine > Hydrogen peroxide > Hydroxyl radical > Ozone

45. **Which of the following cannot be classified as attached growth process?**

(A) Trickling filter   (B) Aerated lagoon

(C) Rotating Biological contactor   (D) Packed bed reactor

46. **The optimum temperature range (°C) within which Mesophilic bacteria perform best is:**

(A) 12-18   (B) 55-65

(C) 41-50   (D) 25-40

47. **The typical hydraulic loading rate in $m^3/m^2/d$ of a high-rate filter with rock media is:**

(A) 10-40   (B) 1-4

(C) 4-10   (D) 40-200

48. **A mixed-liquor sample with a 3000 mg/L total suspended solids concentration that settles to a volume of 300 mL in 30 minutes in a 1-L cylinder would have the sludge volume index of**

(A) 50 mL/g   (B) 100 mL/g

(C) 0.1 mL/g   (D) 2700 mL/g

49. **Operational problem commonly not encountered in activated sludge plant is:**

(A) Bulking sludge   (B) Rising sludge

(C) Nocardia foam   (D) Predator problem

50. **The volumetric BOD loading rate in $kg/m^3.d$ for an complete mix activated sludge process used for only BOD removal would be ?**

Use following data:

1. Volume of wastewater to be treated = 1000 m^3/d

2. Influent BOD of ASP = 250 g/m^3

3. Volume of aeration tank = 300 m^3

(A) 0.833   (B) 833

(C) 75   (D) 1.2

51. **Which one of the following activated sludge processes has the highest solid retention time (SRT)?**

(A) High-rate aeration   (B) Conventional plug flow

(C) Contact stabilization   (D) Oxidation ditch

52. **The thickening methods commonly used for untreated primary sludge is:**

(A) Dissolved air floatation   (B) Rotary drum thickener

(C) Gravity thickening in separate tank   (D) Solid bowl centrifuge

53. **In water softening using natural zeolite as ion exchange material, Ca^{+2} and Mg^{+2} present in the water is exchanged with:**

(A) Na^+ (B) Mn^{+2}

(C) K^+ (D) H^+

54. **The chlorine compound which is commonly not used for disinfection at wastewater plant is:**

(A) Chlorine (Gas or liquid)   (B) Sodium Chloride

(C) Sodium hypochlorite   (D) Calcium hypochlorite

55. **The relation between BOD, COD and TOC of an untreated domestic wastewater is:**

(A) TOC > BOD > COD   (B) COD > BOD > TOC

(C) BOD > COD > TOC   (D) BOD = COD = TOC

56. **The global warming potential of any air pollutant is expressed relative to:**

(A) Carbon monoxide   (B) CFCs

(C) Ozone   (D) Carbon dioxide

57. The affinity of haemoglobin for carbon monoxide is how many times more compare to oxygen:

(A) 200 times
(B) 50 times
(C) 100 times
(D) 150 times

58. The dry adiabatic lapse rate is taken as:

(A) 6°C/km
(B) 9.8°C/km
(C) 6.5°C/km
(D) 7°C/km

59. When ambient lapse rate exceeds the adiabatic lapse rate, the ambient lapse rate is said to be:

(A) Superadiabatic
(B) Dryadiabatic
(C) Subadiabatic
(D) Inversion

60. Which one of the following air pollution control devices is not used for particulate matter?

(A) Centrifugal collector
(B) Gravitational settler
(C) Electrostatic precipitator
(D) Multiple fixed bed adsorber

61. Which of the following air pollutant is a secondary pollutant?

(A) Nitrogen dioxide
(B) Sulphur dioxide
(C) Ozone
(D) Carbon dioxide

62. As per national ambient air quality standards, the 24 hour time weighted concentration of sulphur dioxide in a residential area should not be more than:

(A) 50 $\mu g/m^3$
(B) 20 $\mu g/m^3$
(C) 80 $\mu g/m^3$
(D) 40 $\mu g/m^3$

63. As per Ambient Air Quality Standards in Respect of Noise the maximum permissible level of noise in dB(A) for an industrial area during night time is:

(A) 75
(B) 70
(C) 65
(D) 55

64. The time period between the two successive peaks or trough of a sinusoidal sound wave is called:

(A) Amplitude
(B) Period
(C) Wavelength
(D) Frequency

65. If the sound source has a pressure of 2000 Pa, compute the sound pressure level (L_p) in dB

(A) 40
(B) 20
(C) 100
(D) 2000

66. In trapping the heat from emissions of an incinerator by using waste boilers, which concept of 4R is used?

(A) Reuse
(B) Reduce
(C) Recover
(D) Recycle

67. As per municipal solid waste management manual, Part II, (CPHEEO, 2016) the leachate collection systems are designed to handle the run-off from:

(A) 50 years, 24-hours storm
(B) 20 years, 24-hours storm
(C) 20 years, 12-hours storm
(D) 25 years, 24-hours storm

68. As per EIA notification 2006, the expansion of National High ways greater than 30 KM, involving additional right of way greater than 20 m involving land acquisition and passing through more than one State comes under category

(A) A Project
(B) B1 Project
(C) B2 Project
(D) C Project

69. **As per municipal solid waste management manual, Part II, (CPHEEO, 2016) the active period of the design life of a sanitary landfill is taken as:**

(A) 5-10 years

(B) 20-25 years

(C) 10-15 years

(D) 40-50 years

70. **Which one of following is not the aim of EIA?**

(A) Waste Minimization

(B) Resource conservation

(C) Reduced timeline for project

(D) Efficient use of equipments

71. **As per municipal solid waste management manual, Part II, (CPHEEO, 2016) the concentration of methane gas generated at landfill site shall not exceeds:**

(A) 25% of the lower explosive limit (LEL)

(B) 15% of the lower explosive limit (LEL)

(C) 10% of the lower explosive limit (LEL)

(D) 40% of the lower explosive limit (LEL)

72. **Which approach cannot be used to identify an initial list of environmental factors of potential relevance to a proposed project?**

(A) Use of professional knowledge and experience of handling similar project

(B) Use of pertinent agency guidelines

(C) Review of recent EISs on similar projects

(D) Use of satellite images of the study area

73. **The EIA notification is issued under which act?**

(A) The Forest (Conservation) Act, 1980

(B) The Wildlife Protection Act, 1972

(C) The Environment (Protection) Act, 1986

(D) Air (Prevention and Control of Pollution) Act, 1981

74. **Which of the following pollutant is not considered while defining air quality index (AQI)?**

(A) PAN

(B) Ozone

(C) Particulate matter

(D) Carbon monoxide

75. **The matrix method which can be used for addressing secondary and tertiary impacts is:**

(A) Simple matrix

(B) Stepped matrix

(C) Interaction matrix

(D) Box matrix

76. **The Central Pollution Control Board (CPCB) is constituted under which act?**

(A) Air (Prevention and Control of Pollution) Act, 1981

(B) The Wildlife Protection Act, 1972

(C) The Environment (Protection) Act, 1986

(D) Water (Prevention and Control of Pollution) Act, 1974

77. **Line used to mark 65 and 75 L_{dn} around a runway of an airport is called:**

(A) Noise level lines

(B) Noise line

(C) Noise Contour

(D) Agonic lines

78. **Which of the following is not an advance oxidation process used for treatment of refractory organics present in industrial wastewater?**

(A) UV/Ozone

(B) Photo Fenton

(C) UV/H_2O_2

(D) Zero Valent Iron

79. As per general standards for discharge of environmental pollutants given by CPCB, the COD of the effluent to be discharged in inland surface water should not be greater than:

(A) 250 mg/L
(B) 500 mg/L
(C) 300 mg/L
(D) 350 mg/L

80. As per general standards for discharge of environmental pollutants (Schedule VI, part D) given by CPCB, In case of Lime Kilns of capacity more than 5 t/day and upto 40 t/day, the PM emission shall be within:

(A) 100 mg/Nm^3
(B) 500 mg/Nm^3
(C) 200 mg/Nm^3
(D) 50 mg/Nm^3

81. If u = e^x + y and v = e^x +7y, then the Jacobian $\dfrac{\partial(x,y)}{\partial(u,v)}$ equals _____.

(A) $7e^x$
(B) $6e^x$

(C) $7e^{-x}$
(D) $\dfrac{e^{-x}}{6}$

82. Let $f :[0,1] \to \mathbb{R}$ be continuous function which is differentiable on (0, 1) and such that $f(0) = 1$ and $f(1) = 0$. Then which of the following statements is true in general ?

(A) There exists $c \in$ (0, 1) such that $f(c) = cf'(c)$
(B) There exists $c \in$ (0, 1) such that $f(c) = - cf'(c)$
(C) There exists $c \in$ (0, 1) such that $f'(c) = cf(c)$
(D) There exists $c \in$ (0, 1) such that $f'(c) = - cf(c)$

83. If f(x, y) = $x^2y - xy^2 + 4xy - 4x^2 - 4y^2$ then (0, 0) is

(A) A point of minima
(B) A point of maxima
(C) A saddle point
(D) None of these

84. The improper integral $\displaystyle\int_0^{\pi/2} \dfrac{\sin x}{\sqrt{1-\cos x}}\,dx$ is

(A) divergent
(B) convergent and its value is 0
(C) convergent and its value is 1
(D) convergent and its value is 2

85. Let C denote the closed curve in the first quadrant formed by the parabolas $y^2 = 4x$ and $x^2 = 4y$.

If the area bounded by C is $\dfrac{16}{3}$, then the value of the line integral $\oint_C (xdy - ydx)$ is

(A) $\dfrac{8}{3}$
(B) $\dfrac{16}{3}$

(C) $\dfrac{32}{3}$
(D) $\dfrac{4}{3}$

86. The general solution of the equation $y'' + 2y' - y = 0$ is

(A) $y = e^{-x}(c_1 e^{\sqrt{2}x} + c_2 e^{-\sqrt{2}x})$
(B) $y = e^{\sqrt{2}x}(c_1 e^x + c_2 e^{-x})$

(C) $y = e^x(c_1 e^{\sqrt{2}x} + c_2 e^{-\sqrt{2}x})$
(D) $y = e^{-\sqrt{2}x}(c_1 e^x + c_2 e^{-x})$

87. If the general solulion of the equationdy $\frac{dy}{dx} + y\sin x = e^{\cos x}$ is $(f(x)+c)e^{\cos x}$, then $f(x)$

equals _____
(A) $\sin x$ (B) $\cos x$
(C) x (D) 0

88. The inverse Laplace transform of the function $F(s) = \frac{1}{S^2(S^2+1)}$ is

(A) t cost   (B) t sint
(C) t − cost   (D) t − sint

89. If the Laplace transform of the function $f(t) = \frac{\cos 2t \sin t}{e^t}$ is denoted by F(s), then the value of

F(0) is

(A) $\frac{-1}{5}$ (B) $\frac{1}{5}$

(C) $\frac{-1}{10}$ (D) $\frac{1}{10}$

90. Which of the following is a solution of Laplace equation in two dimensions ?
(A) $e^{-y}\cos x$ (B) $x^2 + y^2$
(C) $e^{-y} + \cos x$ (D) $x^3 + 3x^2 − 3y^2 + 1$

91. If the eigen values of the matrix $\begin{bmatrix} a & 1 \\ 1 & 2b \end{bmatrix}$, (where a, b > 0), are 2 and 3 then the point (a, b) lies

on which of the following straight lines ?
(A) $x + y = 5$ (B) $x + 2y = 6$
(C) $x + y = 1$ (D) $x + 2y = 5$

92. Let A be a square matrix of order 3 and suppose det $A \neq 0$. Then the non-homogeneous system of linear equations Ax = b has
(A) no solulion   (B) unique solution
(C) three solutions   (D) infinite solutions

93. Let C = { Z : $|z| = \frac{3}{2}$ }. Then the value of the contour integral $\int_C \frac{\cos(2\pi z)}{z^2 - 3z + 2} dz$ is

(A) $-2\pi i$ (B) $2\pi i$
(C) 1   (D) −1

94. The coefficient of Z^2 in the Taylor series expension of $f(z) = \sin^2 z$ about z = 0 is
(A) 0   (B) 1

(C) 2   (D) $\frac{1}{2}$

95. Consider functions $f(z) = \overline{z}$ and $g(z) = e^{\overline{z}}$ defined over complex numbers, Then
(A) f and g both are analytic in C   (B) f is analytic but g is not analytic in C
(C) g is analytic but f is not analytic in C   (D) Neither f nor g is analytic in C

96. Bag A contains 2 white and 3 red balls and Bag B contains 4 white and 5 red balls. One ball is drawn at random from one of the bags and it is found to be white. What is the probability that the white ball is drawn from Bag B ?

(A) $\dfrac{9}{19}$

(B) $\dfrac{18}{19}$

(C) $\dfrac{5}{19}$

(D) $\dfrac{10}{19}$

97. The probability of obtaining at least two 'Five' in rolling a fair die 3 times is

(A) $\dfrac{2}{9}$

(B) $\dfrac{1}{9}$

(C) $\dfrac{2}{27}$

(D) $\dfrac{1}{27}$

98. If the mean of the 15 observations is $x_1, x_2, ..., x_{14}, x_{15}$ is 15 then the mean of the 15 observations $y_1, y_2, ..., y_{14}, y_{15}$ (where $y_i = x_i + i$ for $i = 1, 2, ...15$) is

(A) 23

(B) 22

(C) 11

(D) 9

99. Which of the following iteration formula is suitable for computing the cube-root of the number 11?

(A) $x_{n+1} = \dfrac{x^3_n + 11}{2x^2_n}$

(B) $x_{n+1} = \dfrac{3x^3_n + 11}{2x^2_n}$

(C) $x_{n+1} = \dfrac{2x^3_n + 11}{3x^2_n}$

(D) $x_{n+1} = \dfrac{x^3_n + 11}{3x^2_n}$

100. Which of the following is a single step method for numeric solution of ordinary differential equations?

(A) Gauss - Jordan method

(B) Secant method

(C) Runge - Kutta method

(D) Bisection method