1. The equation DP=1/1-p relates degree of polymerization to the extent of the reaction is known as

(A) Huggin's equation

(B) Carother's equation

(C) Mark-Houwink equation

(D) Copolymerization equation

2. What is not true for thermosets ?

(A) They are cross-linked polymers.

(B) They do not melt/soften on heating.

(C) They do not dissolve in any liquid.

(D) They do not have very high molecular weight.

3. The imperfect crystalline regions made from bundles/aggregates of ordered chain are called

(A) Dendrites

(B) Single crystals

(C) Spherulites

(D) Crystallites

4. The value of second virial coefficient (A_2) in the equation $\pi/C=[RT/M]\ (1+A_2C)$ for polymer in θ solvent is

(A) 0

(B) 1.0

(C) 0.5

(D) None of these

5. The property of a homopolymer can be improved by

(A) Copolymerization with some other monomers

(B) Forming polymer alloys

(C) Adding plasticizers

(D) All of the above

6. Which of the following is a monodisperse polymer ?

(A) Natural rubber

(B) Cellulose

(C) Casein

(D) Nylon

7. The T_g of a polymer can be determined by

(A) IR

(B) NMR

(C) TGA

(D) Dilatometry

8. Buna N is a copolymer of

(A) Butadiene & Acrylonitrile

(B) Butadiene & Styrene

(C) Butadiene & Ethylene

(D) Butadiene & Isoprene

9. LDPE differs from HDPE in

(A) Degree of crystallinity

(B) Molecular weight

(C) Melting temperature

(D) All of the above

10. GPC is a chromatographic technique which separates polymer molecules in a sample according to their size and provides

(A) Fractionation

(B) Mol. wt. distribution

(C) Molecular weight

(D) All of the above

11. The glass transition is second order thermal transition in amorphous polymers due to

(A) Segmental motion

(B) Molecular motion

(C) Both

(D) None of the above

12. End group analysis gives

(A) Number average mol. wt.

(B) Weight average mol. wt.

(C) Viscosity average mol. wt.

(D) Z average mol. wt.

13. Excess entropy of polymer solutions is

(A) Zero

(B) Highly positive

(C) Negative

(D) Either positive or negative

14. The technique which yields a number average molecular weight is

(A) Viscometry

(B) Osmometry

(C) Light scattering

(D) Ultracentrifugation

15. Which of the following is a thermoplastic ?

(A) Ebonite

(B) Vulcanized rubber

(C) Bakelite

(D) HDPE

16. The concentration of polymers in solution is often expressed as

(A) Vol %

(B) Molarity

(C) g/dl or wt %

(D) Molality

17. Plasticizers do not affect

(A) Modulus

(B) T_g

(C) T_m

(D) Dielectric loss

18. The initiator used for suspension polymerization

(A) Potassium persulfate

(B) Benzoyl peroxide

(C) AIBN

(D) Lewis acids

19. Which of the following is a branched chain polymer ?

(A) Isotactic polypropyelene

(B) LDPE

(C) HDPE

(D) Amylose (starch)

20. Polystyrene and poly (p-xylene) are

(A) Cis-trans isomers

(B) Structural isomers

(C) Stereoisomers

(D) Functional isomers

21. The reactivity ratios of monomer 1 and monomer 2 are r_1 and r_2. If $r_1=r_2=0$

(A) A block copolymer will form

(B) An alternate copolymer will form

(C) A random copolymer will form

(D) Two homopolymers will form

22. Bisphenol-A is a monomer used in the preparation of

(A) Polycarbonates and epoxy resins

(B) PF and UF resins

(C) Polyurathanes

(D) Alkyd resins

23. The most inert polymer, used in non-sticking kitchen ware is

(A) Melamine resin

(B) PMMA

(C) PVC

(D) Teflon

24. Carbon fiber is obtained by the cyclization followed by dehydrogenation of polyacrylonitrile. It is a

(A) Branched polymer

(B) Star like polymer

(C) Ladder like polymer

(D) Comb like polymer

25. Heat dissipation is accompanied with

(A) Solution polymerization

(B) Bulk polymerization

(C) Suspension polymerization

(D) Emulsion polymerization

26. Which of the following is used as chemical reagent ?

(A) PVC

(B) Pyrolysed PAN

(C) PTFE

(D) Isotactic PP

27. Blood vessel replacement is done with

(A) PMMA

(B) PTFE

(C) Silicones

(D) Carbon fibers

28. The example of a photo conducting polymer is

(A) Polyaniline

(B) Polyacetylene

(C) Polyvinylpyrene

(D) Polythiophene

29. Which is not true for an ionomer ?

(A) They are thermoplastics.

(B) They can form ionic crosslinks between the chains.

(C) They are soluble in water.

(D) They are synthetic organic polymers.

30. Which is true for silicones ?

(A) They are exceptionally stable.

(B) Highly bio-compatible polymers.

(C) They show high heat resistant property.

(D) All of the above.

31. For the production of films and sheets one can use ……...

(A) Blow moulding

(B) Injection moulding

(C) Calendering

(D) Compression moulding

32. Transfer moulding is basically used for

(A) Thermosets

(B) Thermoplastics

(C) Both (A) and (B)

(D) None of the above

33. The rigid polyurethane foam is used in

(A) Packaging

(B) Handling trays

(C) Artificial limbs

(D) Decorative and insulative wall panes

34. Which of the following is a plasticizer ?

(A) Phenyl salicylate

(B) p-cresol

(C) n-dialkyl phthalate

(D) None of the above

35. In order to obtain a high mol wt. polymer by polycondensation

(A) Monomers should be highly pure

(B) Excess of one monomer in a monomer pair should be avoided

(C) The byproducts should be removed during polycondensation

(D) Each of the above is essential

36. Relaxation is not affected by

(A) Tacticity

(B) Crystallinity

(C) Plasticizers

(D) Molecular weight

37. Which of the following is a polar polymer ?

(A) PVOH

(B) PS

(C) PE

(D) All of the above

38. At which temperature will the polymer coil be larger in poor solvent ?

(A) At theta temperature

(B) Below theta temperature

(C) Above theta temperature

(D) None of the above

39. Gutta percha is

(A) Cis-1,4-polyisoprene

(B) Trans-1,4-polyisoprene

(C) Vulcanized polyisoprene

(D) Ebonite

40. In copolymerization, one does not usually observe that the product of the reactivity ratios is very large ($r_1/r_2 >> 1$). In this case

(A) No polymerization takes place

(B) A perfectly alternating copolymer is formed

(C) k_{11} is small compared to k_{22}

(D) No copolymer is formed

41. Vulcanization of natural rubber by sulphur makes it

(A) Water soluble

(B) Soft

(C) Hard

(D) Less elastic

42. Which would be the better solvent for polystyrene ?

(A) n-pentane

(B) Benzene

(C) Acetonitrile

(D) Methanol

43. Nylon 6 is obtained from

(A) Caprolactum

(B) Hexamethylene diamine and adipic acid

(C) Amino acids

(D) Chloroprene

44. Terylene is a

(A) Polyester

(B) Polyamide

(C) Vinyl polymer

(D) Acrylic polymer

45. Nature's monodispersed polymer is

(A) Starch

(B) Cellulose

(C) Insulin

(D) Natural rubber

46. Living anionic polymerization can be conveniently used to produce

(A) Homopolymers

(B) Thermoplasts

(C) Block copolymers

(D) Thermosets

47. The value of α in Mark-Houwink equation $[\eta]=KM^{\alpha}$ in theta solvent is

(A) 1.0

(B) 0

(C) 0.5

(D) 0.8

48. Which of the following additives is added during the polymerization ?

(A) Plasticizers

(B) Antioxidants

(C) Thermal stabilizers

(D) Chain transfer agents

49. The kinetics of addition polymerization shows molecular weight as

(A) Proportional to monomer concentration

(B) Inversely proportional to initiator concentration

(C) Both (A) and (B)

(D) None of the above

50. The Hildebrand's solubility parameter is equal to cohesive energy density and has the unit

(A) $(cal/cm^3)^{1/2}$

(B) cal/cm^3

(C) J/m^3

(D) None of the above

51. Termination under control condition sometimes does not occur in

(A) Anionic polymerization

(B) Cationic polymerization

(C) Free radical polymerization

(D) Coordination polymerization

52. Which is considered as a first synthetic polymer ?

(A) Bakelite

(B) Teflon

(C) Neoprene

(D) Nylon 6

53. The polycondensation of a monomer pair each having bifunctionality always gives

(A) Linear polymer

(B) Branched polymer

(C) Cross-linked polymer

(D) All of the above

54. Which of the following polymers is difficult to crystallize ?

(A) Polyesters

(B) Polyethylene

(C) Polypropylene

(D) Polyvinyl carbazole

55. The polymer used in making buckets, mugs, storage tanks, TV cabinets, etc is

(A) HDPE

(B) PP

(C) PVC

(D) PS

56. A polymer with high mol. wt. and high degree of crystallinity would behave as

(A) Soft and waxy

(B) Hard and flexible

(C) Hard and tough

(D) Soft and flexible

57. What is true for membrane osmometry for the determination of mol. wt. of polymers ?

(A) It gives number average mol. wt.

(B) Dynamic osmometers provide quick determination of osmotic pressure

(C) The solvent should not be a very good solvent

(D) All are correct

58. Polymer solutions can be considered colloidal solutions in that they show

(A) Electrophoresis

(B) Light scattering

(C) Coagulation

(D) Peptization

59. Which of the following polymers are often highly crystalline ?

(A) Fibers

(B) Plastics

(C) Elastomers

(D) Surface coating materials

60. Solution polymerization in CCl_4 often leads to

(A) Low mol. wt. polymers

(B) High mol. wt. polymers

(C) Cross-linked polymers

(D) Polydispersed polymers

61. Which of the following is true in case of thermoforming ?

(A) High output rates may be achieved

(B) Pre-designed and decorated sheets may be used

(C) Products have good physical properties

(D) All of the above

62. …….. may be called as 'no mould technique'.

(A) Drape forming

(B) Slip forming

(C) Free forming

(D) Twin-sheet forming

63. Elastic deformation in polymers is due to

(A) Slight adjust of molecular chains

(B) Slippage of molecular chains

(C) Straightening of molecular chains

(D) Severe of Covalent bonds

64. Kevlar is commercial name for _____ .

(A) Glass fibers

(B) Carbon fibers

(C) Aramid fibers

(D) Cermets

65. Ion exchange resins are made of

(A) Lucite

(B) Sulphonated Bakelite

(C) Polystyrene

(D) None of the above

66. Which of the following is not present in bagasse fibre ?

(A) Cellulose

(B) Lignin

(C) Pentogens

(D) None of these

67. Which of the following is currently used as a tyre cord ?

(A) Terelene

(B) Polypropelene

(C) Nylon 6

(D) Polyethylene

68. A _____ liquid crystal has the least order and is the most liquid-like.

(A) Nematic

(B) Smectic

(C) Cholesteric

(D) Smectic B

69. During a step growth polymerisation:

(A) Monomer disappears early in the reaction

(B) Monomer molecules are still present in the final polymer

(C) Monomer breaks down to form free radicals

(D) Monomer breaks down to form ions

70. In ionic polymerisation "Living Polymer" is formed when

(A) Propagation reactions do not occur

(B) Termination reactions do not occur

(C) Initiation reactions occur faster than termination reactions

(D) Amino acids are used as monomers.

71. If Styrene monomers is polymerised under anionic conditions using butyl lithium as the initiator then,

(A) The rate of polymerisation is faster in a polar solvent than in a non-polar solvent.

(B) The rate of polymerisation is faster in a non-polar solvent than in a polar solvent.

(C) The rate of polymerisation is independent of the reaction solvent.

(D) No polymerisation occurs under these conditions.

72. The effect of chain transfer reagents is to:

(A) Increase the average degree of polymerisation.

(B) Increase the rate of polymerisation.

(C) Reduce average degree of polymerisation.

(D) Reduce the rate of polymerisation.

73. Acrylic resins are

(A) Colourless and transparent

(B) Dark brown and thermoplastics

(C) Dark brown and thermosetting

(D) White like milk

74. 'Celanese silk' is

(A) Cellulose trinitrate

(B) Cellophane

(C) Cellulose acetate

(D) Pyroxylin

75. Which of the following is fully fluorinated polymer ?

(A) Neoprene

(B) Thiokol

(C) Teflon

(D) PVC

76. Use of a parison is associated with which one of the following plastic shaping processes ?

(A) Bi-injection molding

(B) Blow molding

(C) Compression molding

(D) Pressure thermoforming

77. A thermoforming mold with a convex form is called which one of the following ?

(A) A die

(B) A negative mold

(C) A positive mold

(D) A three plate mold

78. Which of the following are bulk deformation processes ?

(A) Extrusion

(B) Forging

(C) Rolling

(D) All of the above

79. Which of the following statements is false ?

(A) The repeat unit in natural rubber is isoprene.

(B) Both starch and cellulose are polymers of glucose.

(C) Artificial silk is derived from cellulose.

(D) Nylon-6,6 is an example of elastomer.

80. $[NH(CH_2)NHCO(CH_2)_4CO]_n$ is a

(A) Addition polymer

(B) Thermosetting polymer

(C) Homopolymer

(D) Co-polymer

81. Polymer used in bullet proof glass is

(A) Lexane

(B) Nomex

(C) PMMA

(D) Kevlar

82. 'Starch' consists of two fractions; one is α-amylose and the other is

(A) Amylopectin

(B) Pecticamide

(C) Glycogen

(D) Alginic acid

83. Which polymer is used for making magnetic recording tapes ?

(A) Dacron

(B) Glyptal

(C) Acrilan

(D) Bakelite

84. Melamine is

(A) Gas

(B) White crystalline solid

(C) Yellow liquid

(D) Colloidal solution

85. Complete hydrolysis of cellulose gives

(A) D-fructose

(B) D-glucose

(C) D-ribose

(D) L-glucose

86. Which of the following is not a polymer ?

(A) Gun cotton

(B) Shellac

(C) Perspex

(D) Wax

87. Orlon is a polymer of

(A) Styrene

(B) Vinyl chloride

(C) Tetrafluoro ethylene

(D) Acrylonitrile

88. Triethyl aluminium titanium chloride used in

(A) Vulcanizer

(B) Z-N catalyst

(C) Plasticizer

(D) Telomer

89. Which of the following is biodegradable polymer ?

(A) Cellulose

(B) PVC

(C) Polythene

(D) Nylon-6

90. Nylon threads are made of

(A) Polyethylene polymer

(B) Polyvinyl polymer

(C) Polyester polymer

(D) Polyamide polymer

91. Which of the following statements is not true about low density PE ?

(A) Tough

(B) Hard

(C) Poor conductor of electricity

(D) Highly branched structure

92. …… is not a semi-synthetic polymer.

(A) Cis-polyisoprene

(B) Cellulose nitrate

(C) Cellulose acetate

(D) Vulcanized rubber

93. Stereoregular polymers are

(A) Isotactic, syndiotactic, atactic

(B) Natural and synthetic

(C) Addition and condensation

(D) Elastomers, plastics and fibre

94. Disproportionation of polymer chain growth yields

(A) Polymer with longer chain length

(B) Two polymers with shorter chain lengths

(C) Three polymers

(D) All of the above

95. Branching in the polymer chain

(A) Decreases Tg value

(B) Stabilises Tg value

(C) Increases Tg value

(D) Does not affect Tg value

96. Which of the following polymer is a very good insulator ?

(A) Nylon 6,6

(B) Teflon

(C) Polyethylene

(D) Neoprene

97. IUPAC name of chloroprene is

(A) 2-chloro-1,3-butadiene

(B) 2-methyl-1,3-butadiene

(C) Isobutene

(D) Isobutene and isoprene

98. The most suitable reducing agent for reductive doping of polyacetylene is

(A) Acidified potassium dichromate

(B) Iodine vapours

(C) Iodine in carbon tetrachloride

(D) Sodium naphthalide in THF

99. Which of the following polymers is used in smart windows ?

(A) Conducting polyacetylene

(B) Conducting polyaniline

(C) Conducting polythiophene

(D) All the above polymers

100. When P/F is less than 1, the product formed is

(A) Novolac

(B) Bakelite

(C) Mixture of Novolac and Bakelite

(D) None of the above

101. Which of the following polymer has ozone resistance ?

(A) Butyl rubber

(B) Neoprene rubber

(C) Natural rubber

(D) Both (A) and (B)

102. A polymer which can be used as synthetic adhesive is

(A) Neoprene

(B) Buna-S

(C) Epoxy resin

(D) Polystyrene

103. Which of the following polymer can hold organic solvents ?

(A) Natural rubber

(B) Butyl rubber

(C) Polysulphide rubber

(D) All of the above

104. The polymer used as electrodes in rechargeable batteries is

(A) Conducting polyaniline

(B) Teflon

(C) Polyacetylene

(D) Polyaniline

105. Polymer used in the preparation of automobile tyres and tubes is

(A) Buna-S

(B) Polysytrene

(C) Neoprene rubber

(D) Butyl rubber

106. Number of monomer molecules which take part in polymerization is

(A) Degree of polymerization

(B) Molecular weight of polymer

(C) T_g of polymer

(D) None of the above

107. Polymer used as corrosion control paint is

(A) PMMA

(B) Bakelite

(C) Teflon

(D) All the above

108. The monomer phenol is

(A) Monofunctional

(B) Bifunctional

(C) Trifunctional

(D) Polyfunctional

109. Elastic deformation in polymers is due to

(A) Slight adjust of molecular chains

(B) Slippage of molecular chains

(C) Straightening of molecular chains

(D) Severe of covalent bonds

110. Strong covalent bonds exist between polymer chains in

(A) Thermoplasts

(B) Thermosets

(C) Elastomers

(D) All of the above

111. Inulin is a polymer of

(A) Glucose

(B) Galactose

(C) Fructose

(D) Arabinose

112. The polymer containing strong intermolecular forces e.g. hydrogen bonding is

(A) PS

(B) NR

(C) Teflon

(D) Nylon 6,6

113. Following is unique to polymeric materials

(A) Elasticity

(B) Viscoelasticity

(C) Plasticity

(D) None of the above

114. PVOH is obtaind by the hydrolysis of PVA but not by the polymerization of vinyl alcohol monomer because the monomer is

(A) Difficult to purify

(B) Converts to acetaldehyde

(C) Difficult to polymerize

(D) Water soluble

115. Polyphenylene vinylene possess a chemical structure which is intermediate between that of

(A) Polyacetylene and Polyethylene

(B) Polyethylene and Polyvinyl chloride

(C) Polyethylene and Polystyrene

(D) Polyphenylene and Polyacetylene

116. Block copolymer molecule in selective solvent (good solvent for one block, precipitant for the other) associate and thus behave like

(A) Surfactants

(B) Dyes

(C) Proteins

(D) Drugs

117. The polymer can be obtained from latex by

(A) Coagulation

(B) Non-solvents

(C) Evaporation

(D) Crystallization

118. At temperature above T_g but below T_m, a polymer is considered to be

(A) Crystalline solid

(B) Super cooled crystal

(C) Glassy solid

(D) None of these

119. Which of the following polymers of glucose is stored by animals ?

(A) Cellulose

(B) Amylose

(C) Amylopectin

(D) Glycogen

120. The determination of weight average molecular weight from light scattering involves a double extrapolation on the same graph. The grid like figure is called

(A) Zimm plot

(B) Chromatogram

(C) Turbidity plot

(D) Mol. wt. distribution curve

Space For Rough Work