

RPSC - A.En.

Assistant Engineering

MECHANICAL

Rajasthan Public Service Commission (RPSC)

Volume - 1

Production Engineering

PRACTICE SHEET

OBJECTIVE QUESTIONS

- Fibre reinforce metallic composite can not used for
 - Resisting corrosive wear
 - Increased toughness
 - Metal cutting
 - All of the above
- Cast iron contains carbon % age as
 - 0.2 to 0.4
 - 2 to 4
 - 1 to 1.5
 - None of these
- Depth of steel hardness is increased by adding
 - Cobalt
 - Tungsten
 - Chromium
 - Manganese
- Tensile strength of mild steels normally is in the range
 - 150-180 MPa
 - 320-600 MPa
 - 550-750 MPa
 - 650-1000 MPa
- Carbon percentage in eutectoid steels is
 - 0.5
 - 0.8
 - 0.65
 - 1.4
- Cast iron are classified as per
 - Sulphur percentage
 - Iron percentage
 - Tensile strength
 - Ident hardness
- Monel metal consists of
 - Nickel, lead and mangesium
 - Zinc, Tin and lead
 - Nickel, copper
 - Carburizing
- Find the process which is different from others.
 - Nitirding
 - Galvanizing
 - Cyaniding
 - Carburizing
- German silver is an alloy of
 - Silver and aluminium
 - Nickel and silver
 - Silver with tin
 - Nickel, copper and zinc
- Steel containing 0.8% carbon and 100% pearlite is known as
 - Ferrite
 - Eutectoid
 - Austenite
 - Cementite
- Solder is an alloy of
 - Tin and zinc
 - Tin and lead
 - Lead and zinc
 - Tin and copper
- Steels with coarse grains are
 - Lighter
 - Denser
 - Very tough
 - Less tough
- Nodular iron has
 - High melting point
 - High tensile strength
 - Low machinability
 - All of these
- Under microscope pearlite appears as
 - White feathery
 - Finger print
 - Light spots
 - Dark spots
- High speed steel are basically
 - Alloy steel
 - Plain carbon steel
 - Low carbon steel
 - Medium carbon steel
- Steel containing ferrite and pearlite is
 - Soft
 - Brittle
 - Ductile
 - Data insufficient
- The major constituents of stellite are
 - Cobalt, chromium and tungsten
 - Zinc, lead and copper
 - Nickel, copper and tin
 - None of the above

18. The main component of any hardened steel is
(a) Carbon (b) Pearlite
(c) Martensite (d) Sorbite
19. Slow plastic deformation of metals under a constant value of stress is known as
(a) Plastic deformation
(b) Elastic deformation
(c) Creep
(d) Fatigue
20. Which of the following has hexagonal closed packed structure?
(a) Silicon (b) Germanium
(c) Aluminium (d) Zinc
21. The major defect responsible for the phenomenon of slip is called
(a) Fracture (b) Twinning
(c) Strain hardening (d) Dislocation
22. Recrystallization temperature is one at which
(a) Change of allotropic form takes place
(b) Crystals first start forming from molten metal when it is cooled
(c) New spherical crystals are formed from the old one when a strained metal is heated.
(d) None of the above
23. Engineering materials which are made up of more than one phase, with different mechanical properties, are known as
(a) Discontinuous (b) Plastic
(c) Heterogeneous (d) None of these
24. Which of the following constituents of steel is softest?
(a) Ferrite (b) Ledeburite
(c) Pearlite (d) Austenite
25. Which of the following type of materials are usually the most ductile?
(a) Body-centred cubic lattice
(b) Face-centred cubic lattice
(c) Hexagonal close-packed lattice
(d) Simple cubic lattice
26. Ductile fracture witnesses
(a) Major plastic deformation before crack propagation
(b) Faster crack propagation
(c) Nil deformation
(d) Noise accompanying the process
27. Pure iron is basically
(a) Austenite (b) Cementite
(c) Ferrite (d) Ferrite and cementite
28. The brittle fracture tendency increases by
(a) Increased temperature and increase strain rate
(b) Decreased temperature and increased strain rate
(c) Prior plastic deformation
(d) Decrease in triaxial stress
29. Ferromagnetic alpha iron exists in temperature range of
(a) Above 1539°C (b) 1300-1539°C
(c) 870-910°C (d) Below 723°C
30. Pearlite phase is consists of alternate layers of
(a) Ferrite and cementite
(b) Ferrite and ledeburite
(c) Cementite and bainite
(d) Bainite and troosite
31. Material property to absorb energy when deformed elastically and to return it when it is unloaded is known as
(a) Indent hardness
(b) Resilience
(c) Creep phenomenon
(d) Toughness
32. Paramagnetic alpha iron changes to gamma iron at
(a) Above 1539°C (b) 1040°C
(c) 910°C (d) 770°C
33. Addition of manganese to low carbon steels results in
(a) Making them tough
(b) Making them hard and tough
(c) Improve machinability
(d) None of the above

34. Capacity of a material to absorb energy in the plastic range is called
(a) Proof load (b) Resilience
(c) Creep (d) Toughness
35. Annealing of white cast iron produces
(a) Grey cast iron (b) Nodular cast iron
(c) Spheroidal cast iron (d) Malleable cast iron
36. Nickel in steel improves
(a) Cutting ability and decreases hardenability
(b) Ductility, tensile strength and toughness
(c) Improves wear resistance and toughness
(d) None of the above
37. Duralumin alloy contains aluminium and copper in the ratio of
(a) 94 % Al, 4% Cu
(b) 95 % Al, 5% Cu
(c) 87 % Al, 13% Cu
(d) 82 % Al, 10% Cu, 2% Ni
38. Delta iron are temperature range
(a) Upto 800°C
(b) Between 800°C and 1200°C
(c) 800°C to critical temperature
(d) Between 1400°C and 1530°C
39. Corundum contains which of the following as majority ingredient?
(a) Fe₂O₃ (b) MgO
(c) Al₂O₃ (d) SiO₂
40. Hardenability of steel is the
(a) Depth of the hardened zone due to quenching
(b) Ability to withstand heat shock
(c) Resistance to wear and abrasion
(d) None of the above
41. Gamma iron exists in the temperature range
(a) 900°C and 1400°C
(b) 600°C and 850°C
(c) 1400°C and 1600°C
(d) 1600°C and 1800°C
42. Line imperfection is known as
(a) Edge dislocation (b) Schottky defect
(c) Misrum (d) Screw dislocation
43. Which of the following controls the properties of steel?
(a) Nickel (b) Carbon
(c) Vanadium (d) Chromium
44. Austempering process results in the formation of
(a) Troostite (b) Bainite
(c) Cementite (d) Martensitic
45. Which amongst following has zero temperature coefficient?
(a) Cobalt steel (b) Cast iron
(c) Invar steel (d) Hadfield steel
46. Which of the following is correct composition of babbitt metal?
(a) 84% Sn, 2% Cu, 6% Sb, 5% Al, 3% Mg.
(b) 87.75% Sn, 4% Cu, 8% Sb, 0.25% Bi.
(c) 80% Sn, 6% Cu, 5% Sb, 6% Al,
(d) 82% Sn, 4% Cu, 10% Sb, 4% Al,
47. Slowly cooled steel inside furnace develops which structure?
(a) Cementite (b) Pearlite
(c) Martensite (d) Troosite
48. Which of the following is alloyed with high carbon tool steels to increase the resistance to shock?
(a) Nickel (b) Vanadium
(c) Carbon (d) Tungsten
49. Quenching of steel in water, forms
(a) Cementite (b) Pearlite
(c) Martensite (d) Troosite
50. Which of the following is most ductile material?
(a) Nickel (b) Mild steel
(c) Brass (d) Zinc
51. Quenching of steel in oil, form
(a) Cementite (b) Pearlite
(c) Martensite (d) Troosite
52. On rockwell 'C' scale, one rockwell number indicates penetration depth of
(a) 0.0080 of an inch
(b) 0.00080 of an inch
(c) 0.080 of an inch
(d) 0.000080 of an inch

53. Recrystallization temperature can be decreased by
- (a) Working at high temperature
 - (b) Grain refinement
 - (c) Adding metals and non-metal
 - (d) None of the above
54. Which of the following counteracts the effect of sulphur?
- (a) Manganese (b) Silicon
 - (c) Molybdenum (d) Boron
55. Atomic packing fraction is maximum for
- (a) SSC (b) BCC
 - (c) MCP (d) FCC
56. Process in which steel is upto 40°C, below the lower critical temperature, held at that temperature for a time and then allowed to cool slowly in the furnace is called
- (a) Annealing (b) Tempering
 - (c) Austempering (d) Case hardening
57. A bearing alloy must possess which of the following properties?
- (a) High coefficient of friction
 - (b) Low compressive strength
 - (c) High resistance to corrosion
 - (d) All of these
58. Corrosion resistance of steels is increased by the addition of alloying elements like
- (a) Cobalt and manganese
 - (b) Phosphorous
 - (c) Sulphur
 - (d) Nickel and chromium
59. Ball bearings are generally made of
- (a) Cast iron
 - (b) Stainless steel
 - (c) Carbon chrome steel
 - (d) Plain carbon steel
60. Austenite is a solid solution of carbon in which of the following?
- (a) Beta (b) Alpha
 - (c) Gamma (d) Delta
61. Which of the following has lowest melting point?
- (a) High carbon steel
 - (b) Alloy steel
 - (c) Cast iron
 - (d) Pig iron
62. Presence of silicon in cast iron
- (a) Makes the casting unsound
 - (b) Makes iron machinable
 - (c) promotes graphite
 - (d) Precipitates carbon
63. Which of the following is the property of ceramics?
- (a) Malleability and plasticity
 - (b) Elasticity and ductility
 - (c) Brittleness and hardness
 - (d) High temper brittleness
64. Recrystallization temperature can be decreased by
- (a) Grain refinement
 - (b) Working at low temperature
 - (c) Metal purification
 - (d) All of these



ANSWER & EXPLANATIONS

- | | | |
|---------------------|---------------------|---------------------|
| 1. <i>Ans. (c)</i> | 23. <i>Ans. (c)</i> | 45. <i>Ans. (c)</i> |
| 2. <i>Ans. (b)</i> | 24. <i>Ans. (a)</i> | 46. <i>Ans. (b)</i> |
| 3. <i>Ans. (d)</i> | 25. <i>Ans. (b)</i> | 47. <i>Ans. (b)</i> |
| 4. <i>Ans. (b)</i> | 26. <i>Ans. (a)</i> | 48. <i>Ans. (b)</i> |
| 5. <i>Ans. (b)</i> | 27. <i>Ans. (c)</i> | 49. <i>Ans. (c)</i> |
| 6. <i>Ans. (c)</i> | 28. <i>Ans. (b)</i> | 50. <i>Ans. (b)</i> |
| 7. <i>Ans. (c)</i> | 29. <i>Ans. (d)</i> | 51. <i>Ans. (d)</i> |
| 8. <i>Ans. (b)</i> | 30. <i>Ans. (a)</i> | 52. <i>Ans. (b)</i> |
| 9. <i>Ans. (d)</i> | 31. <i>Ans. (b)</i> | 53. <i>Ans. (b)</i> |
| 10. <i>Ans. (b)</i> | 32. <i>Ans. (c)</i> | 54. <i>Ans. (a)</i> |
| 11. <i>Ans. (b)</i> | 33. <i>Ans. (b)</i> | 55. <i>Ans. (d)</i> |
| 12. <i>Ans. (d)</i> | 34. <i>Ans. (d)</i> | 56. <i>Ans. (b)</i> |
| 13. <i>Ans. (b)</i> | 35. <i>Ans. (d)</i> | 57. <i>Ans. (c)</i> |
| 14. <i>Ans. (b)</i> | 36. <i>Ans. (b)</i> | 58. <i>Ans. (a)</i> |
| 15. <i>Ans. (a)</i> | 37. <i>Ans. (a)</i> | 59. <i>Ans. (c)</i> |
| 16. <i>Ans. (a)</i> | 38. <i>Ans. (d)</i> | 60. <i>Ans. (c)</i> |
| 17. <i>Ans. (a)</i> | 39. <i>Ans. (c)</i> | 61. <i>Ans. (c)</i> |
| 18. <i>Ans. (c)</i> | 40. <i>Ans. (a)</i> | 62. <i>Ans. (b)</i> |
| 19. <i>Ans. (c)</i> | 41. <i>Ans. (a)</i> | 63. <i>Ans. (c)</i> |
| 20. <i>Ans. (d)</i> | 42. <i>Ans. (a)</i> | 64. <i>Ans. (d)</i> |
| 21. <i>Ans. (d)</i> | 43. <i>Ans. (b)</i> | |
| 22. <i>Ans. (c)</i> | 44. <i>Ans. (b)</i> | |

