BPSC TEST

Date: 08 July, 2018

TEST 04 (OBJECTIVE SOLUTION)...

ANSWERS

1.	(c)	16.	(d)	31.	(a)	46.	(b)	61.	(a)
2.	(a)	17.	(d)	32.	(d)	47.	(a)	62.	(d)
3.	(a)	18.	(c)	33.	(c)	48.	(d)	63.	(b)
4.	(b)	19.	(d)	34.	(d)	49.	(c)	64.	(c)
5.	(d)	20.	(c)	35.	(d)	50.	(c)	65.	(b)
6.	(a)	21.	(c)	36.	(b)	51.	(a)	66.	(a)
7.	(d)	22.	(b)	37.	(c)	52.	(c)	67.	(d)
8.	(a)	23.	(c)	38.	(c)	53.	(b)	68.	(b)
9.	(b)	24.	(a)	39.	(a)	54.	(b)	69.	(c)
10.	(a)	25.	(a)	40.	(c)	55.	(b)	70.	(d)
11.	(a)	26.	(b)	41.	(d)	56.	(c)	71.	(a)
12.	(b)	27.	(a)	42.	(d)	57.	(d)	72.	(b)
13.	(a)	28.	(a)	43.	(c)	58.	(d)	73.	(a)
14.	(d)	29.	(c)	44.	(a)	59.	(a)	74.	(d)
15.	(c)	30.	(d)	45.	(a)	60.	(b)	75.	(c)

BPSC TEST-04 Solutions

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1. (c)

2. (a)

In super-charging, the air of increased density should be retained in the power cylinders after the exhaust ports or the valves are closed.

3. (a)

4. (b)

5. (d)

In petrol and diesel engines the combustion takes place inside the cylinder. So, these are internal combustion engines but in a steam turbine power is produced through passing of steam over turbines.

6. (a)

7. (d)

Since aircraft operates at a height, so air density is low. Hence, to increase inlet air density, supercharging is employed.

Supercharging is important for aircrafts because the engine operation takes place at high altitude where density of air is low. To increase inlet air density, supercharging is employed.

8. (a)

9. (b)

10. (a)

Ignition delay is the definite period of time inactivity before the ignition starts.

11. (a)

12. (b)

13. (a)

14. (d)

Thermodynamic equilibrium is a sum total of all the following equilibriums

(i) Thermal equilibrium

(ii) Mechanical equilibrium

(iii) Chemical equilibrium

15. (c)

16. (d)

Extensive properties are dependent of man entropy internal energy and potential energy all are effected by mass.

Heat and work are path functions and cannot be point functions.

17. (d)

18. (c)

19. (d)

$T_2 = \sqrt{1600 \times 400} = 800$

20. (c)

21. (c)

22. (b)

23. (c)

24. (a)

PV = C (Isothermal)

$PV^{\gamma} = C$ (Adiabatic)

PV^n = C (Polytropic)

P = C (Isobaric)

V = C (Isochoric)

25. (a)

26. (b)

n = 1 $\rightarrow$ isothermal

n = ∞ $\rightarrow$ isochoric

n = 0 $\rightarrow$ isobaric

n = 1.4 $\rightarrow$ adiabatic

27. (a)

28. (a)

29. (c)

Zeroth law deals with measurement of temperature which states that if two thermodynamic systems are each in thermal equilibrium with a third, then they are in thermal equilibrium with each other.

30. (d)

(a) $W = \overset{0}{\uparrow}P(d/v) = 0$

(b) For free expansion as resistance offered is zero thermodynamic work is zero.

(c) For throttling $h_1 = h_2$ and there is no entraction only expansion takes place so W = 0.

31. **(a)**

32. **(d)**

33. **(c)**

34. **(d)**

35. **(d)**

36. **(b)**

37. **(c)**

38. **(c)**

Polytropic workdone = $\frac{p_2V_2 - p_1V_1}{1-n}$

Adibatic work = $\frac{p_2V_2 - p_1V_1}{1-\gamma}$

Isochoric work = $\overset{0}{\overset{\uparrow}{p}}(dV) = 0$

Isobaric work = pdV

39. **(a)**

40. **(c)**

41. **(d)**

42. **(d)**

43. **(c)**

44. **(a)**

45. **(a)**

46. **(b)**

47. **(a)**

48. **(d)**

During throttling

$$h_1 + \frac{v_1^2}{2} + Q = h_2 + \frac{v_2^2}{2} + W$$

where Q = (heat transfer) = 0

W(Work extraction) = 0

v_1 and v_2 are inlet and outlet velocities which are negligible.

Hence, $h_1 = h_2$.

49. **(c)**

$$\frac{V_1}{V_2} = \frac{T_1}{T_2}$$

$$T_2 = \frac{T_1 \times V_2}{V_1} = \frac{300 \times 2V}{V} = 600 \text{ K or } 327°C$$

50. **(c)**

51. **(a)**

52. **(c)**

Pump — Isentropic compression

Boiler — Constant pressure heat addition

Turbine — Isentropic expansion

Condenser — Constant pressure heat rejection.

53. **(b)**

54. **(b)**

55. **(b)**

56. **(c)**

Since universe cannot interact with any other known system, universe is considered to be an isolated system.

57. **(d)**

Heat and work are path functions, so these are not properties.

58. **(d)**

59. **(a)**

60. **(b)**

61. **(a)**

62. **(d)**

Enthalpy is a property of the system which is point function not path function.

63. **(b)**

Since air and liquid are two different phases their mixture is not a pure substance.

64. **(c)**

65. **(b)**

The maximum efficiency of a reversible engine can be found by $\eta = 1 - \frac{T_2}{T_1}$ where T_2 is lower temperature and T_1 is the higher temperature.

66. **(a)**

67. **(d)**

68. **(b)**

69. **(c)**

70. **(d)**

71. **(a)**

72. **(b)**

73. **(a)**

74. **(d)**

Carburettor is responsible for providing the desired air fuel ratio to the engine under all running conditions.

75. **(c)**