

BPSC TEST

Date: 20 March, 2019

TEST 17 (OBJECTIVE SOLUTION)...



ANSWERS

1. (a)	11. (a)	21. (b)	31. (d)	41. (b)
2. (b)	12. (a)	22. (d)	32. (d)	42. (a)
3. (a)	13. (c)	23. (a)	33. (c)	43. (b)
4. (a)	14. (c)	24. (c)	34. (d)	44. (a)
5. (a)	15. (b)	25. (b)	35. (b)	45. (a)
6. (c)	16. (a)	26. (d)	36. (c)	46. (d)
7. (b)	17. (c)	27. (c)	37. (d)	47. (a)
8. (b)	18. (c)	28. (a)	38. (b)	48. (c)
9. (c)	19. (c)	29. (a)	39. (d)	49. (d)
10. (c)	20. (c)	30. (d)	40. (c)	50. (a)

BPSC TEST-17 Solutions

Date: 20 March, 2019

1. (a)

2. (b)

3. (a)

4. (a)

5. (a)

6. (c)

7. (b)

Peak of 4-hr direct runoff hydrograph = 240 – base flow

$$= 200 \text{ m}^3/\text{sec}$$

∴ Peak of 4 hr unit hydrograph

$$= \frac{200}{8} \{80 \text{ mm} = 8\text{cm}\}$$

$$= 25 \text{ m}^3/\text{sec}$$

8. (b)

9. (c)

$$\text{Risk} = 1 - (1 - P)^n$$

$$0.10 = 1 - (1 - P)^{10}$$

$$(1 - P)^{10} = 0.9$$

$$(1 - P) = 0.9^{1/10}$$

$$P = 1 - 0.9^{1/10}$$

$$T = 1/P$$

$$= \left(\frac{1}{1 - 0.9^{1/10}} \right)$$

10. (c)

11. (a)

12. (a)

13. (c)

14. (c)

15. (b)

16. (a)

17. (c)

18. (c)

19. (c)

Transmissibility is defined as discharge per unit thickness of the aquifer.

20. (c)

21. (b)

Porosity = specific yield + specific retention

∴ Specific yield = porosity – specific retention

22. (d)

23. (a)

24. (c)

25. (b)

26. (d)

$$\text{Length} = \frac{NS^2}{4.4}$$

$$= \frac{\left(\frac{1}{50} - \left(-\frac{1}{50} \right) \right) \times 80^2}{4.4}$$

$$= \frac{0.04 \times 80 \times 80}{4.4}$$

$$= 58.18 \text{ m}$$

$$\approx 59 \text{ m}$$

27. (c)

$$\text{Basic capacity} = 1000 \times \frac{V}{S}$$

$$= \frac{1000 \times 50}{20}$$

$$= 2500 \text{ vehicles/hr}$$

28. (a)

29. (a)

30. (d)

31. (d)

$$y_c = \left(\frac{q^2}{g} \right)^{1/3}$$

$$= \left(\frac{\left(\frac{12.5}{5} \right)^2}{9.81} \right)^{1/3}$$

$$= 0.637^{1/3}$$

$$\approx 0.64^{1/3} \text{ m}$$

32. (d)

Type of jump	Froude number
Undular jump	$1 < F_1 < 1.7$
Weak jump	$1.7 < F_1 \leq 2.5$
Oscillating jump	$2.5 < F_1 \leq 4.5$
Steady jump	$4.5 < F_1 \leq 9.0$
Strong jump	$F_1 > 9.0$

{ F_1 = Froude number before jump}

33. (c)

$$R = \frac{y}{2}$$

$$= \frac{\left(\frac{B}{2} \right)}{2}$$

$$= \frac{B}{4}$$

$$= 1.25 \text{ m}$$

34. (d)

$$y_1 + \frac{V_1^2}{2g} = y_2 + \frac{V_2^2}{2g}$$

$$y_1 + \frac{q^2}{2gy_1^2} = y_2 + \frac{q^2}{2gy_2^2}$$

$$\frac{q^2}{g} = \frac{2y_1^2 y_2^2}{(y_1 + y_2)}$$

$$q^2 = \frac{2 \times 2^2 \times 0.5^2}{(2 + 0.5)} \times 9.81$$

$$q = 2.8 \text{ m}^3/\text{sec}/\text{m}$$

35. (b)

36. (c)

37. (d)

By boiling, only temporary hardness can be removed.

38. (b)

39. (d)

40. (c)

41. (b)

As per IS10500 : 2012,
For TDS :

Acceptable limit = 500 mg/l

Permissible limit in absence of alternate source = 2000 mg/l

42. (a)

Ground water has lack of dissolved oxygen and therefore, the impurities remain in dissolved form and not precipitate like in surface water.

43. (b)

44. (a)

Carbonate hardness = minimum [total hardness, alkalinity]

45. (a)

46. (d)

47. (a)

Let bleaching powder required = 'x' gm
Purity = 30%

For 1 l of water, chlorine required = 0.2 mg

$$\therefore 0.3 \times x = 0.2$$

$$\therefore x = \frac{0.2}{0.3} = \boxed{0.67 \text{ mg}}$$

48. (c)

49. (d)

50. (a)

SVI is the volume occupied in ml by 1 gm of settled solid.

$$\therefore \text{SVI} = \frac{36 \text{ ml}}{4 \text{ gm}} = 9$$

Website : www.iesmaster.org E-mail: info@iesmaster.org

Office : F-126, Katwaria Sarai, New Delhi-110016 (Phone : 011-41013406, 8130909220, 9711853908)

IES MASTER
Institute for Engineers (IES/GATE/PSUs)