

ENGINEERING HYDROLOGY

(Various State AEn/JEn, RRB-JE, PSUs MCQs with Answer Key)

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CH 01 Intro

1. A fine sprinkle of numerous water droplets of size less than 0.5 mm and intensity less than 1mm/h is known as.

(MP VYPAM 8-7-2017 2and meeting)

- (a) Hail (b) Drizzle
(c) Glaze (d) Fog

2. The conjunctive use of water in a basin means.

(UKPSC A E Paper II 2013)

- (a) Combined use of water for irrigation and hydropower generation
(b) Use of water by farmer's cooperative depth of drain below the ground surface
(c) Use of water for irrigating both Rabi and Kharif crops
(d) Combined use of surface and ground water resources

3. Percentage of water available on earth that is saline is

(U.K. Combined A E Paper II 2012)

- (a) 33% (b) 67%
(c) 97% (d) 0%

4. Hydrology is the science which deals with

(U.K. Combined A E Paper II 2012

IOF JE 2015)

- (a) Rain water
(b) River water
(c) Sea water
(d) Surface and ground water

5. Hydro science (Hydrology) cycle is denoted by equation

(UPSSC JE 2015)

- (a) $P = E + R$ (b) $P = E - R$
(c) $P = ER$ (d) $P = E/R$

6. Which term is appropriate for the branch of physical geography which deals with the origin, distribution of water on the earth surface?

(DFCCIL, 17-4-2016)

- (a) Hydrolysis (b) Oxidation
(c) Hydropethia (d) Hydrology

7. The hydrologic equation states that

(U.K. Combined A E Paper II 2012)

- (a) $\sum inflow = \sum outflow$
(b) $\sum inflow - \sum outflow = constant$
(c) Subsurface inflow = Subsurface out flow
(d) $\sum inflow - \sum out flow = Change in storage$

8. Which of the following is not a form of precipitation?

(U.K. Combined AE Paper II 2012)

- (a) Snow (b) Rain
(c) Hail (d) Smog

9. Hydrology is necessary for civil engineers for

(I.O.F. JE 2015)

- (a) Designing and construction of irrigation structure
(b) Designing and construction of ridges and culverts
(c) Flood control works
(d) All of these

10. Precipitation includes

(I.O.F. JE 2015)

- (a) Rain (b) Snow
(c) Hail (d) All of these

11. Humidity is measured by:

(MP Sub. Eng. 2016)

- (a) Hydrometer
(b) Hygrometer
(c) Hyctometer
(d) Anemometer

Answer key:

1. b	2. d	3. c	4. d
5. a	6. d	7. a	8. d
9. d	10. d	11. b	

CH 02 Hydrometeorology

1. Convective precipitation is caused by:

(MP VYAPM Sub Eng. 9-6-2017)

- (a) Cirrus clouds
(b) Stratiform clouds
(c) Cumuliform clouds
(d) Orographic clouds

2. Humidity refers to the.

(Raj. SSB JE 3-7-2016/

MP Sub Eng. 9-7-2017)

- (a) Volume of the air
(b) Water vapour in the air
(c) Pressure of the moisture
(d) Mass of the air

3. Rain during cold weather season is due to

(U.K. Combined AE Paper II 2012)

- (a) High pressure
(b) Low pressure

- (c) Both (a) & (b)
 (d) None of the above
4.is the result from lifting of warm moisture laden air masses due to topographic barriers.

(M.P. Sub Eng. 2016)

- (a) Convective precipitation
 (b) Orographic precipitation
 (c) Cyclonic precipitation
 (d) Hydrography precipitation
5. A rainfall with intensity of 5 mm/hr is classified as

(Jharkhand SSC JE 2016)

OR

A rainfall with intensity of 5 mm/h is classified as

(UPRRVUNL AE 2015)

- (a) Trace (b) Light rain
 (c) Moderate rain (d) Heavy rain

Answer key:

1. c	2. b	3. a	4. b
5. c			

CH 03 Measurement of Precipitation

1. Standard rain gauge adopted in India is:

(MP VYAPM Sub Eng. 9-6-2017)

RRB JE Ahmedabad Yellow

Paper 14-12-2014)

- (a) None of the above
 (b) Tipping bucket type
 (c) Weighing bucket type
 (d) Natural syphon type

2. If allowable percentage error in the estimate of basic rainfall is 'E' and co efficient of variation of rainfall is 'C', then optimum number of rain gauges is given by

(U.K. Combined AE paper II 2012)

- (a) $\sqrt{\frac{C_v}{R}}$ (b) C_v/E
 (c) $\left(\frac{C_v}{E}\right)^{3/2}$ (d) $\left(\frac{C_v}{E}\right)^2$

3. The rain gauge must be set as near the ground as possible

(Uttarakhand Combined State

AE Paper II 2007)

- (a) To reduce elevation effect
 (b) To reduce wind effect
 (c) To reduce slope effect
 (d) To avoid visibility

4. Which of the following types of rain gauge is used for measuring rain in remote area?

(U.K. Combined State AE Paper II 2007)

- (a) Tipping bucket type
- (b) Weighing bucket type
- (c) Floating type
- (d) Simon's rain gauge

5. Double mass curve technique is followed to

(U.K. Combined AE Paper II 2012)

- (a) Check the consistency of rain gauge record
- (b) Find the average rainfall over a number of years
- (c) Find the number of rain gauge required
- (d) Estimate the missing precipitation values

6. Which is the simple method of estimating average rainfall if the rainfall is uniformly distributed on its areal pattern?

(M.P. VyapamDraftan 2016)

- (a) Arithmetic average method
- (b) Thiessen polygon method
- (c) Isohyetal method
- (d) All of the above

7. The precipitation is measured in terms of

(U.K. Combined AE Paper II 2012)

- (a) Intensity of pressure
- (b) Depth of water
- (c) Quantity of water
- (d) Volume of water

8. A rain gauge should preferable be fixed

(U.K. J.E. Paper II 2015/

H.P. SSC 2015)

- (a) Near the building
- (b) Under the tree
- (c) In an open space
- (d) In a closed space

9. The plot between rainfall intensity and time is called

(U.K. 2015)

- (a) Mass curve
- (b) Hyetograph
- (c) Isohyetal lime
- (d) Hydrograph

10. The standard Symon type rain-gauge has a collecting diameter equal to

(U.K. Paper II JE 2015)

- (a) 5.08 cm (b) 10.0 cm
(c) 12.7 cm (d) 24.5 cm

11. What is Rain Hyetograph?

(MP Sub. Eng. 2015)

- (a) Graph plotted between Rainfalls in mm Versus Time in Hr
(b) Bar Chart showing Rainfall intensity Versus Time
(c) Graph showing Discharge Versus Time
(d) Graph showing accumulated precipitation Versus Time

12. Which method gives accurate estimate of average rainfall in a hill area catchment?

(UKPSC AE Paper II 2013)

- (a) Isohyetal method
(b) Normal ration method
(c) Arithmetic mean method
(d) Thiessen polygon method

13. Mean precipitation over an area is best obtained from gauged amounts by

(HPSSSB JE 3-7-2016)

- (a) Arithmetic mean method
(b) Thiessen method

(c) Linearly interpolated isohyetal method

(d) Orographically weighted isohyetal method

Answer key:

1. d	2. d	3. b	4. a
5. a	6. a	7. b	8. c
9. b	10. c	11. b	12. a
13. c			

CH 04 Abstractions from Precipitation

1. A hydrological study conducted in a small town revealed that the intensity of rainfall is more than the infiltration capacity of soil. The infiltration rate in this area will be.

(Coal India 2016)

- (a) > rate of rainfall
(b) = infiltration capacity
(c) = rate of rainfall
(d) > infiltration capacity

2. Evaporation is measure by using.

(Uttarakhand 2015)

- (a) An open pan
(b) Lysimeter
(c) Infiltrometer

- (d) A neutron tube
3. Available moisture may be defined as

(Uttarakhand Paper II JE 2015)

- (a) Difference in water content of the soil between field capacity and permanent wilting point
- (b) Moisture content at permanent wilting point
- (c) Maximum water holding capacity
- (d) None of the above
4. Evapo-transpiration of water by a crop means water consumed by

(Uttarakhand Paper II JE 2015)

- (a) Evaporation only
- (b) Conveyance loss and evaporation
- (c) Transpiration and conveyance loss
- (d) Transpiration and evaporation
5. Meyer's formula is an empirical formula used to determine.

(MP VYAPM Sum Eng. 9-6-2017)

- (a) Transpiration
- (b) Evaporation losses
- (c) Infiltration capacities
- (d) None of the above
6. If 'B' and 'd' are the bed width and depth of a channel in meter respectively, the combined losses

due to evaporation and seepage in cumec per kilometer length of the channel is.

(Uttarakhand Combined State

AE Paper II 2017)

(a) $\frac{1}{50} (B + d)^{2/3}$

(b) $\frac{1}{100} (B + d)^{2/3}$

(c) $\frac{1}{150} (B + d)^{2/3}$

(d) $\frac{1}{200} (B + d)^{2/3}$

7. Lysimeter is used for measuring

(Uttarakhand Paper II JE 2015)

- (a) Infiltration
- (b) Evaporation
- (c) Vapour pressure
- (d) Evapo-transpiration

8. If the intensity of rainfall is more than the infiltration capacity of soil, then the infiltration rate will be

(Raj. SSB JE 3-7-2016/

UK Combined AE Paper II 2012)

- (a) Equal to rate of rainfall
- (b) Equal to infiltration capacity
- (c) More than rate of rainfall
- (d) More than infiltration capacity

9. If pan evaporation is denoted E_p and actual evaporation by E , then
(U.K. Combined A E Paper II 2012)

- (a) $E_p > E$ (b) $E > E_p$
(c) $E = E_p$ (d) $E < E_p$

10. Transpiration occurs only
(U.K. Combined State AE Paper II 2007)

- (a) In night
(b) In hills
(c) In sea
(d) None of these

11. Rainfall simulator type in filtrometers give lower values than flooding type infiltrometers because
(U.K. Combined State AE Paper II 2012)

- (a) Impact of rainfall is considered
(b) Equipment is very heavy
(c) Both (a) and (b)
(d) None of the above

12. Evapotranspiration is confined to:
(UKPSC AE Paper II 2013)

- (a) Day light hours only
(b) Night time only
(c) Fallow land surface only

(d) None of the above

13. Find the runoff if 5 hours storm had 5 cm of rainfall and the resulting runoff was 2.5 mm and if the ϕ -index remains at the same value the runoff due of 12 cm of rainfall in 15 hours.

(M.P. VyapamDraftman 2016)

- (a) 4.5 cm (b) 4.6 cm
(c) 4.7 cm (d) 4.8 cm

14. What is the unit of runoff in M.K.S. system?

(MNRC JE 2017)

- (a) cubic metre/sec
(b) square metre
(c) cubic metre
(d) metre/sec

15. Under the same conditions, which of the following shapes of water surface will give the highest rate of evaporation?

(H.P. SSC 2015)

- (a) Convex water surface
(b) Flat water surface
(c) Concave water surface
(d) Independent of shape of water surface

16. The rates of rainfall for successive 20 min period of 140 minutes are

(STUDY MATERIAL FOR RRB JE CBT2 | CIVIL ENGG)

2.5, 2.5, 10, 7.6, 1.25, 1.25 and 5 cm/h. Taking the value of phi-index as 3.2 cm/h, the total runoff (in cm) is :

(LMRC AR 2017 I-Shift)

- (a) 6 (b) 4.33
(c) 10 (d) 5

17. Which one of the following pairs is NOT correctly matched?

(F.C.I. JE 2016)

- (a) Water losses Evaporation
(b) Run off Stream flow
(c) Percolation Soil Erosion
(d) Storm Precipitation

18. The ratio of actual evapo- transpiration to potential evapo- transpiration is in the range

(DSSSB JE 2015)

- (a) 0.0 to 0.4 (b) 0.6 to 0.9
(c) 0 to 1 (d) 1.0 to 2.0

Answer key:

1. b	2. b	3. a	4. d
5. b	6. d	7. d	8. b
9. a	10. d	11. a	12. a
13. a	14. a	15. a	16. b
17. c	18. c		

CH 05 Runoff

1. A 60% index of wetness means

(U.K. Combined A E Paper II 2012)

- (a) Rain excess of 40%
(b) Rain deficiency of 40%
(c) Rain deficiency of 60%
(d) None of the above

Ans: b

CH 06 Stream Flow Measurement

1. Which of the following method is not a direct stream flow measurement technique:

(U.K. Combined State AE Paper II 2007)

- (a) Dilution method
(b) Ultrasonic method
(c) Area velocity method
(d) Slope area method

Ans: d

CH 07 Hydrograph

1. For a unit hydrograph, what is the best unit duration of storm:

- (KMC JE 2017)
- (a) Equal to basin lag
(b) one fourth of basin lag
(c) 1 hour
(d) One half of basin lag
2. The delayed flow that reaches the river mainly as ground water is known as
(U.K. Combined State AE Paper II 2007)
- (a) Underground flow
(b) Virgin flow
(c) Base flow
(d) None of these
3. Unit hydrograph method is usually adopted for estimating floods when the catch is:
(U.K. Combined State AE Paper II 2007)
- (a) Less than 5000 km²
(b) More than 7500 km²
(c) More than 10000 km²
(d) None of these
4. When the unit duration of an unit hydrograph decreases and approaches zero hydrograph is called

(U.K. Combined State AE Paper II 2007)

- (a) Instantaneous unit hydrograph
(b) Constant unit hydrograph
(c) Straight line hydrograph
(d) Poly unit hydrograph

5. Unit Hydrograph Theory was enunciated by

(U.K. Combined AE Paper II 2012/ IOF JE 2015)

- (a) Merrill Bernard
(b) W.W. Horner
(c) Le-Roy K. Sherman
(d) Robert E-Horten

6. Separation of base flow from/total runoff can be done by:

(KPSC AE Paper II 2013)

- (a) Straight line method
(b) Two line method
(c) Curve extension method
(d) All of the above

7. S-hydrograph is used to obtain unit hydrograph of

(H.P. SSC 2015)

- (a) Shorter duration from longer duration

(b) Longer duration from shorter duration

(c) Both (a) and (b)

(d) None of the above

8. The volume of rainfall which produces equal run off is called

(U.K. Paper II JE 2015)

(a) Point rainfall

(b) Effective rainfall

(c) Average rainfall

(d) None of the above

9. Area under a 4 Hour unit hydrograph curve is 10 million cum. The catchment area associated with this unit hydrograph would be:

(MP Sub. Eng. 2015)

(a) 10^4 Hectares

(b) 10^5 Hectares

(c) 10^6 Hectares

(d) 10^7 Hectares

10. The unit hydrograph is the graphical relation between which of the following options?

(MP Sub. Eng. 2016)

(a) Total rainfall and total runoff

(b) Total rainfall and the direct runoff

(c) Effective rainfall and the total runoff

(d) Effective rainfall and the direct runoff

OR

Unit hydrograph method is generally used for transformation of:

(UKPSC AE Paper II 2013)

(a) Total rainfall into total runoff

(b) Excess rainfall into runoff

(c) Total rainfall into direct runoff

(d) Excess rainfall into direct runoff

11. The shape of the recession limb of a hydrograph depends upon

(UKPSC AE Paper II 2013)

(a) Basin characteristics only

(b) Storm characteristics only

(c) Both (a) and (b)

(d) None of the above

12. Instantaneous unit hydrograph is a hydrograph of

(HPSSSB JE 2016)

(i) Unit duration

(ii) Unit rainfall excess

(iii) Infinitely small duration

(iv) Infinitely small rainfall excess

(STUDY MATERIAL FOR RRB JE CBT2 | CIVIL ENGG)

- (a) (i) and (ii) (b) (i) and (iv)
 (c) (ii) and (iii) (d) (iii) and (v)

Answer key:

1. b	2. c	3. a	4. a
5. c	6. d	7. c	8. b
9. b	10. d	11. a	12. c

CH 08 Floods

1. Estimation of Peak flood discharge for a catchment measuring 180 sq. km is done using Dicken's formula with a coefficient $C = 16$. The Peak flood discharge would be:

(MP Sub. Eng. 2015)

- (a) 493 m³/s (b) 1246 m³/s
 (c) 786 m³/s (d) 2160 m³/s

2. According to Reyve's formula for estimating floods, the peak discharge is proportional to

(Uttarakhand Paper II JE 2015)

- (a) A (b) A^{2/3}
 (c) A^{3/4} (d) A^{1/2}

3. Dicken's formula for high flood discharge is used for the catchments in

(Uttarakhand Paper II JE 2015)

- (a) Eastern India
 (b) Western India
 (c) Northern India
 (d) Southern India

4. If observed annual runoff from a basin of area 500 km² is 150 Mm³ and corresponding annual rainfall over the basin during the same year is 750 mm, then runoff coefficient will be

(U.K. Combined A E Paper II 2015)

- (a) 0.2 (b) 0.67
 (c) 0.4 (d) 0.5

5. The probability that a T year flood occurs in any year is

(U.K. Combined AE Paper II 2012)

- (a) $\frac{1}{T}$ (b) $\left[\frac{1}{T}\right]^2$
 (c) $\log \left[\frac{1}{T}\right]$ (d) $\left[\frac{1}{T}\right]^3$

6. The probable maximum flood

(U.K. Combined AE Paper II 2012)

- (a) is less than standard project flood
 (b) is more than standard project flood

- (c) is same as design flood
(d) none of the above
7. For the estimate of high floods in fan shaped catchment, the formula used is

(U.K. Combined AE Paper II 2012)

- (a) Dicken's formula
(b) Ryve's formulas
(c) Inglis formula
(d) None of these
8. Dicken's formula for determining maximum flood (with usual notation), is

(U.K. Paper II JE 2015/

U.K. Combined AE Paper II 2012)

- (a) $Q_p = CA^{3/4}$
(b) $Q_p = CA^{2/3}$
(c) $Q_p = c\sqrt{A}$
(d) $Q_p = 177c\sqrt{A}$
9. The flood discharge in cumec is given by $Q = CA^{3/4}$, the given formula is called as:

(M.P. Sub Eng. 2016)

- (a) Manning's formula
(b) Inglis formula
(c) Ryve's formula

(d) Dicken's formula

10. If area of the catchment is 62.5 sq. mm and axial length of the catchment is 10 mm, the form factor will be.

(UPPCL & SSC 2016)

- (a) 0.625 (b) 0.31
(c) 6.25 (d) 1

11. For calculating the maximum flood discharge in Northern India by Dicken's formula the value of coefficient 'C' is

(U.K. Combined AE Paper II 2012)

- (a) 13.9 (b) 19.5
(c) 11.4 (d) 22.4

Answer key:

1. c	2. b	3. c	4. c
5. a	6. b	7. c	8. a
9. d	10. a	11. c	

CH 09 Flood Routing

1. Which of the following equations is used in hydrologic flood routing method?

(Jharkhand SSC JE 2016)

(STUDY MATERIAL FOR RRB JE CBT2 | CIVIL ENGG)

- (a) Lacey's equation
- (b) Equation of motion
- (c) Energy equation
- (d) Continuity equation

Ans: d

CH 10 Ground Water Hydrology

N/A

THE END

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