

## RRB Junior Engineer - 1st Stage Grand Test – RRB-JE-T1 – 190307

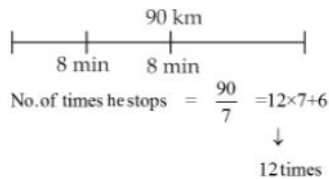
### HINTS & SOLUTIONS

#### ANSWER KEY

1.(3)	21.(2)	41.(3)	61.(1)	81.(4)
2.(3)	22.(2)	42.(3)	62.(2)	82.(2)
3.(4)	23.(4)	43.(1)	63.(4)	83.(2)
4.(2)	24.(3)	44.(2)	64.(3)	84.(4)
5.(4)	25.(4)	45.(1)	65.(4)	85.(3)
6.(2)	26.(2)	46.(2)	66.(2)	86.(1)
7.(1)	27.(2)	47.(2)	67.(3)	87.(2)
8.(1)	28.(1)	48.(3)	68.(2)	88.(2)
9.(1)	29.(2)	49.(4)	69.(1)	89.(2)
10.(1)	30.(1)	50.(1)	70.(1)	90.(1)
11.(2)	31.(4)	51.(2)	71.(1)	91.(2)
12.(3)	32.(4)	52.(1)	72.(4)	92.(4)
13.(2)	33.(3)	53.(4)	73.(3)	93.(1)
14.(2)	34.(2)	54.(2)	74.(4)	94.(3)
15.(3)	35.(2)	55.(4)	75.(3)	95.(3)
16.(3)	36.(4)	56.(2)	76.(2)	96.(1)
17.(2)	37.(4)	57.(3)	77.(3)	97.(2)
18.(2)	38.(3)	58.(1)	78.(3)	98.(4)
19.(2)	39.(2)	59.(2)	79.(4)	99.(3)
20.(2)	40.(4)	60.(2)	80.(3)	100.(2)

#### HINTS & SOLUTIONS

1.(3)



Time taken if he never stops =  $\frac{90}{18} = 5$  h  
 Total time of stopping =  $12 \times 8 = 96$  min  
 Hence, total time = 5h + 96 min  
 = 6h 36 minute

2.(3)

Let CP = x  
 loss% = Profit%

$$\frac{CP - SP_1}{CP} \times 100 = \frac{SP_2 - CP}{CP} \times 100$$

$$\Rightarrow \frac{x - 60}{x} = \frac{80 - x}{x}$$

$$\Rightarrow 2x = 140$$

$$\Rightarrow x = 70$$

$$\% \text{ profit} = \frac{80 - 70}{70} \times 100 = \frac{100}{7} = 14 \frac{2}{7} \%$$

3.(4)

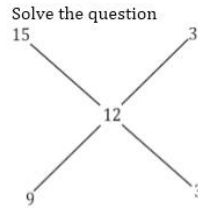
$$a - \frac{1}{a} = 3$$

Squaring both sides

$$a^2 + \frac{1}{a^2} - 2 = 9$$

$$\Rightarrow a^2 + \frac{1}{a^2} = 11$$

4.(2)



$$\frac{\text{amount of sugar sold at 15\% profit}}{\text{amount of sugar sold at 3\% profit}} = \frac{3}{1}$$

$\therefore$  the amount of sugar sold of 3% profit  
 =  $\frac{1}{1+3} \times 60 = 15$  kg

5.(4)

Let the angles be  $2x$  &  $x$   
 ATQ,  
 $2x + x = 90^\circ$   
 $x = 30^\circ$   
 Required angle =  $2x = 60^\circ$

6.(2)

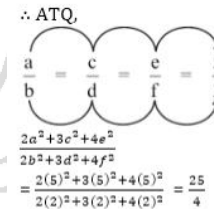
Usual time =  $6 \times 20 = 120$  minutes  
 = 2 hr

7.(1)

$$LCM = \frac{LCM(4,7,1)}{HCF(5,9,18)} = \frac{28}{1}$$

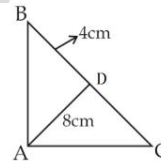
8.(1)

$\therefore$  ATQ,



$$\frac{2a^2 + 3c^2 + 4e^2}{2b^2 + 3d^2 + 4f^2} = \frac{2(5)^2 + 3(5)^2 + 4(5)^2}{2(2)^2 + 3(2)^2 + 4(2)^2} = \frac{25}{4}$$

9.(1)



We know  
 $AD^2 = BD \times CD$   
 $\Rightarrow (8)^2 = 4 \times CD$   
 $CD = 16$

10.(1)

By sine rule,  
 $\frac{8\sqrt{2}}{\sin 45^\circ} = \frac{x}{\sin 90^\circ}$   
 $x = \frac{8\sqrt{2} \times 1}{1} = 16$  cm

11.(2)

Distance covered at 50 km/hr in 5 hour = 250 km  
 Remaining distance =  $370 - 250 = 120$  km  
 Required speed =  $\frac{120}{3} = 40$  km/hr

12.(3) Profit according to merchant = 20%

$$\Rightarrow 20 = \frac{SP-CP}{SP} \times 100$$

$$\frac{1}{5} = 1 - \frac{CP}{SP}$$

$$\frac{CP}{SP} = \frac{4}{5}$$

$$\text{Actual profit} = \frac{SP-CP}{CP} \times 100$$

$$= \left[ \frac{SP}{CP} - 1 \right] \times 100$$

$$= \left[ \frac{5}{4} - 1 \right] \times 100$$

$$= 25\%$$

13.(2) Let  $12\frac{1}{2}\%$  of x liters = 25 l

$$\text{So, } 12\frac{1}{2}\% \text{ of } 1000x \text{ ml} = 25 \text{ l}$$

$$\text{or, } 1000x \times \frac{25}{2} \times \frac{1}{100} = 25$$

$$x = 0.2 \text{ l}$$

14.(2) Let the number are a : b, Its duplicates ratio  $a^2 : b^2$

$$\text{From the question} = \frac{a^2}{b^2} = \frac{9}{16} \text{ or, } \frac{a}{b} = \frac{3}{4}$$

$$\text{Triplicate ratio} = \frac{a^3}{b^3} = 27/64$$

$$\Rightarrow 27 : 64$$

15.(3)  $4 \times 2$  must be divisible by 8

$$(a) 1 \rightarrow \frac{412 \times}{8}$$

$$(b) 2 \rightarrow \frac{422 \times}{8}$$

$$(c) 3 \rightarrow \frac{432 \times}{8} \checkmark$$

$$(d) 4 \rightarrow \frac{442 \times}{8}$$

16.(3)  $\frac{2}{3}A = \frac{50}{100}B = \frac{8}{10}C$

$$\Rightarrow \frac{2}{3}A = \frac{1}{2}B = \frac{4}{5}C$$

$$\Rightarrow \frac{2}{3}A = \frac{1}{2}B \quad \& \quad \frac{1}{2} \times B = \frac{4}{5}C$$

$$\Rightarrow \frac{A}{B} = \frac{3}{4} \Rightarrow \frac{B}{C} = \frac{8}{5}$$

$$\therefore A : B : C = 3 : 4 : 4$$

$$B : C = 8 : 8 : 5$$

$$24 : 32 : 20$$

$$\Rightarrow 6 : 8 : 5$$

17.(2)  $6x^2 - 11x - 35 = 0$

$$6x^2 - 21x + 10x - 35 = 0$$

$$3x(2x - 7) + 5(2x - 7) = 0$$

$$(3x + 5)(2x - 7) = 0$$

$$x = \frac{7}{2} \text{ and } \frac{-5}{3}$$

18.(2) In radius of an equilateral triangle

$$= \frac{\text{Side}}{2\sqrt{3}} = \frac{8\sqrt{3}}{2\sqrt{3}} = 4 \text{ cm}$$

19.(2)  $\angle SRQ = 90^\circ$  (angle in semi-circle)

$$\angle QRP = \angle QSR = y$$

(angle in alternate segmental)

$$\text{Also, } \angle PRS = 90 + y^\circ$$

In  $\Delta PRS$

$$\angle SRP + \angle PRS + \angle PSR = 180^\circ$$

$$(90 + y^\circ) + x^\circ + y^\circ = 180^\circ$$

$$x + 2y = 90^\circ$$

20.(2) Three fourth of 124 =  $124 \times \frac{3}{4} = 31 \times 3$

$$= 93$$

$$\text{Two-third of } 90 = 90 \times \frac{2}{3} = 60$$

$$\text{Difference} = 93 - 60 = 33$$

21.(2) Total runs of first 20 innings =  $20 \times 42 = 840$

$$\text{Total runs of 21 innings } 840 + 84 = 924$$

$$\text{Average of 21 innings} = \frac{924}{21} = 44$$

22.(2) Time taken by First train = 10 hr

Time taken by second train = 10 hr

Train 1 Train 2

Time 10 10

Speed 1 1

Distance covered by Train-1 until 6 am =  $1 \times 2 = 2$  units

$$\text{Meeting time} = \frac{10-2}{2} = 4 \text{ hrs}$$

Time : 6 am + 4 hr = 10 am

23.(4) Area of semicircle =  $\frac{\pi r^2}{2} = 1925$

$$\Rightarrow r = 35 \text{ cm}$$

Now, length =  $\pi r + 2r = 180 \text{ cm}$

breadth =  $24 \times 4 = 96 \text{ cm}$

Perimeter of rectangle =  $2 [180 + 96] = 552 \text{ cm}$

24.(3) Work done by Amit in 3 days =  $\frac{1}{2}$  unit

Work done by Amit in 1 day =  $\frac{1}{6}$  unit

So, work done by Amit in 4 days =  $4 \times \frac{1}{6} = \frac{2}{3}$  unit

Hence, work done by Ram in 4 days =  $1 - \frac{2}{3} = \frac{1}{3}$  unit

Days taken by Ram to do  $\frac{1}{2}$  unit work

= 4 days  $\rightarrow \frac{1}{3}$  unit work

$\frac{4 \times 3}{1}$  days  $\rightarrow 1$  unit work

$\frac{4 \times 3}{2}$   $\rightarrow \frac{1}{2}$  unit work

Ram will now take 6 days.

25.(4)

	A	B	C
Capital	25000	50,000	75,000
	$\times 24$	$\times 18$	$\times 12$
	6,00,000	9,00,000	9,00,000

A : B : C

6 : 9 : 9

$\rightarrow 2 : 3 : 3$

Ratio of profit

$$A \times 40\% = B \times 75\%$$

$$\Rightarrow \frac{A}{B} = \frac{15}{8}$$

Now,

B's income = x% of A's income

$$\Rightarrow 8 = \frac{x}{100} \times 15$$

$$\Rightarrow x = \frac{800}{15} = \frac{160}{3}$$

27.(2)

Putting x = 1

$$1 + a + b = 15$$

$$\Rightarrow a + b = 14$$

putting x = -1

$$1 - b + a = -1$$

$$\Rightarrow a - b = -2$$

On solving a = 6, b = 8

$$2ab = 2 \times 6 \times 8 = 96$$

28.(1)

$$\text{Required average} = \frac{250+375+200+400+75}{5}$$

$$= \frac{1300}{5} = 260$$

29.(2)

$$A + B = 250 + 375 = 625$$

$$D + E = 400 + 75 = 475$$

$$\text{Required \% tax} = \frac{625-475}{625} \times 100 = 24\%$$

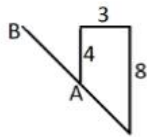
30.(1)

$$A + E = 250 + 75 = 325$$

$$D = 400$$

$$\text{Required \%} = \frac{400-325}{400} \times 100 = 18.75\%$$

31.(4)



North - West direction

32.(4)

33.(3) Typhoons in china is known as willy willies in Australia, Hurricanes in Caribbean and Tornadoes in West Africa

34.(2)  $2^2 + 3^2 : 4^2 + 5^2$   
 $\Rightarrow 9 : 41$   
 $4^2 + 5^2 : 6^2 + 7^2 \Rightarrow 41 : 85$

35.(2) + 3 Series

36.(4) Kharaj, Khums, Jizya are the three out of four taxes sanctioned by the Quran. Fourth one is Zakat.

37.(4) Paralysis is related to movement similarly, Amnesia is related to memory.

38.(3) Correct order is 25431

39.(2) aba/aba/aba/aba

40.(4) Correct sequence of yugas according to vedas is Satya - yuga → Treta - yuga → Dvapara - yuga → Kali - yuga

41.(3)

42.(3)



43.(1)

$$\frac{14 \times 14}{2} = 98$$

$$\frac{11 \times 12}{2} = 66$$

$$\frac{15 \times 16}{2} = 120$$

44.(2)

45.(1) Difference of 1, 4, 9, 16 and 25.

46.(2)  $42 \div 7 + 5 \times 3 - 20 = 1$   
 $\Rightarrow 6 + 15 - 20 = 1$   
 $\Rightarrow 1 = 1$

47.(2)

$26 - 2 \times 30 \div 6 + 16 = 20$   
 Inter changing - & + we get,  
 $26 + 2 \times 30 \div 6 - 16 = 20$   
 $= 26 + 10 - 16 = 20$

48.(3) YZXYXYX

49.(4) Only II is true

50.(1)  $7 \times 14 \div 2 - 48 + 4$   
 $\Rightarrow 49 - 48 + 4 = 5$

51.(2)

52.(1) Present age of Rahul's brother =  $\frac{30}{6} \times 5 = 25$  years - 4 = 21  
 $\therefore$  Present age of Rahul =  $\frac{21}{3} \times 5 = 35$  years  
 Age of Rahul after 3 years = 35 + 3 = 38 years

53.(4)

54.(2)  $\theta^\circ = \frac{1}{2}[60h - 11m]$   
 $\theta^\circ = \frac{1}{2}[60 \times 11 - 11 \times 30]$   
 $\Rightarrow [330 - 165]$

55.(4)



56.(2)

Vande Mataram is a poem written by Bankim Chandra Chattopadhyay in 1870s, which he included in his 1881 novel Anandamath. The poem was composed into song by Rabindranath Tagore. The first political occasion when it was sung in 1896 session of the Indian National Congress.

57.(3)

The Second Battle of Panipat was fought on November 5, 1556, between the forces of Hemu, the Hindu general and Chief Minister of Adil Shah Suri, and the army of the Mughal emperor, Akbar.

58.(1)

The Great Barrier Reef is the world's largest coral reef system. The reef is located in the Coral Sea, off the coast of Queensland, Australia in Pacific Ocean.

59.(2)

The Fundamental Duties of citizens were added to the Constitution by the 42nd amendment in 1976.

60.(2)

The National Board for Wildlife (NBWL) has recently given its approval for the Trishna Gas project of ONGC to extract Natural Gas from Trishna Wildlife Sanctuary (TWS) in Belonia subdivision of Gomati district of Tripura.

61.(1)

Muhammad bin Tughluq was the Sultan of Delhi from 1324 to 1351. In his reign, he conquered Warangal, Malabar and Madurai, and areas up to the modern day southern tip of the Indian state of Karnataka.

62.(2)

The Mudrarakshasa is a historical play in Sanskrit by Vishakhadatta that narrates the ascent of the king Chandragupta Maurya to power in India. It is dated variously from the late 4th century to the 8th century.

63.(4)

Hachure is the short lines used on maps to shade or to indicate slopes and their degree and direction.

64.(3)

The legislative council is a continuing chamber, that is, it is a permanent body and is not subject to dissolution. But, one-third of its members retire on the expiration of every second year. So, a member continues as such for six years.

65.(4)

The Delhi government has decided to provide the Capital's farmers a Minimum Support Price (MSP) for their crops based on the recommendations of the M.S. Swaminathan Committee's report.

66.(2)

Mahabalipuram is the ancient sea port of the famous Pallava kingdom. According to the inscriptions, the monuments of Mahabalipuram was constructed by Pallava kings Mahendravarman I (600 to 630 AD), his son Narasimhavarman I (630 to 668 AD) and their descendants.

67.(3)

The non-cooperation Movement was firmly launched on 1 August, 1920. Tilak passed away in the early hours of 1 August, and the day of mourning and of launching of the movement merged as people all over the country observed hartal and took out processions.

68.(2)

National Disaster Management Authority has been constituted with the Prime Minister of India as its Chairman, a Vice Chairman with the status of Cabinet Minister, and eight members with the status of Ministers of State.

69.(1)

Suresh Tendulkar headed committee named as Suresh Tendulkar Committee to look into the people living under poverty line in India. A committee was formed by government of India in 2005, with Tendulkar as chairman to 'report on methodology of estimation of poverty'.

70.(1)

Jayaprakash Narayan wrote book 'Why Socialism'.

71.(1)

Carbon dioxide gas is used in a fire extinguisher to control small fires, often in emergency situations.

72.(4)

Proton, electron and neutron are part of an atom. These particles are also known as three fundamental particles, but the photon is associated with light energy and also known as energy packet of light.

## Grand Test – RRB-JE-T1 – 190307



- 73.(3) A fluorescent lamp or fluorescent tube is a gas discharge lamp that uses electricity to excite mercury vapour. It contains Mercury Vapour and Argon.
- 74.(4) Photosynthesis takes place in the presence of chlorophyll and sunlight.
- 75.(3) Pancreas and gonads are mixed glands i.e. they are both endocrine and exocrine.
- 76.(2) Tobacco is a product prepared from the leaves of the tobacco plant by curing them. Tobacco contains the alkaloid nicotine, which is a stimulant and make it harmful for human consumption.
- 77.(3) Biochemical oxygen demand (BOD, also called biological oxygen demand) is the amount of dissolved oxygen needed (i.e., demanded) by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period.
- 78.(3) Algae are chlorophyll-bearing, simple, thalloid, autotrophic and largely aquatic (both fresh water and marine) organisms.
- 79.(4) Animals like annelids and arthropods etc. where the body can be divided into identical left and right halves in only one plane, exhibit bilateral symmetry.
- 80.(3) Sexual reproduction in Algae that takes place through fusion of two similar size gametes is called Isogamous.
- 81.(4) The SI unit of frequency is the hertz (Hz), named after the German physicist Heinrich Hertz; one hertz means that an event repeats once per second.
- 82.(2) Wood is a good insulator.
- 83.(2) Bubbles of air rise up through liquids due to viscosity and buoyancy.
- 84.(4) Anemometer, device for measuring the speed of airflow in the atmosphere, in wind tunnels, and in other gas-flow applications. Most widely used for wind-speed measurements is the revolving-cup electric anemometer, in which the revolving cups drive an electric generator.
- 85.(3) Chromite is the only ore of chromium, a metal essential for making stainless steel, nichrome, chrome plating, pigments, refractories, chemicals and pharmaceuticals.
- 86.(1) Water has maximum density.
- 87.(2) Oxidation is the loss of electrons or an increase in oxidation state by a molecule, atom, or ion.
- 88.(2) Haematite is an ore of Iron.
- 89.(2) Alpha particles made of 2 protons and 2 neutrons and they have low penetrating power.
- 90.(1) Oxidation is loss of electrons and addition of oxygen. It also involve addition of electronegative element.
- 91.(2) Newton's first law is other name of Galileo's law of Falling bodies. According to Law of Fall "The distance travelled by falling body is directly proportional to the square of the time it takes to fall". This latter claim states that a body in motion will continue its motion so long as no factor disturbs that motion. This principle is called the principle of inertia which is basis of Newton's first law.
- 92.(4) A transistor is a semiconductor device used as an amplifying device.
- 93.(1) The unit of measurement of Noise is Decibel.
- 94.(3) Total internal reflection is responsible for the glittering of air bubble rising through water.
- 95.(3) In an optical fibre the signal is transmitted due to total internal reflection.
- 96.(1) Visible light has the lowest frequency among the following electromagnetic radiations.
- 97.(2) The Theory of relativity is postulated by Albert Einstein.
- 98.(4) Angular Velocity is same on every point on a rotating body.
- 99.(3) Trajectory is the path followed by a projectile flying or an object moving under the action of given forces, a curve or surface cutting a family.
- 100.(2) Adolf Gaston Eugen Fick was credited with invention of the Contact Lens.