

# SSC GRADUATE LEVEL TIER-I EXAM (1ST SITTING), 21-04-2013 – PREVIOUS YEAR PAPER

## GENERAL AWARENESS

1. Which of the following metals is used in Space Crafts to withstand high temperatures ?

- (1) Fe
- (2) Ti
- (3) Ni
- (4) Pb

**Solution:2**

2. Over use of resource is called "Tragedy of Commons". It was propounded by:

- (1) Garrett Hardin
- (2) Seligman
- (3) Adolph Wagner
- (4) A.P Lemier

**Solution:1**

3. 'National Youth Day' is marked on :

- (1) January 15
- (2) January 9
- (3) January 18
- (4) January 12

**Solution:4**

4. The highest altitude (4411 meters above sea level) is of:

- (1) Daocheng Yading Airport
- (2) Heathrow Airport
- (3) Kathmandu Airport
- (4) Bangda Airport

**Solution:1**

5. Which of the following is protected under Wildlife (Protection) Act, 1972?

- (1) Porcupine

- (2) Gerbil
- (3) Bandicoot rat
- (4) Squirrel

**Solution:1**

6. Brass gets discoloured in air due to constant exposure in presence of:

- (1) Aluminium phosphide
- (2) Hydrogen sulphide
- (3) Hydrogenated wafers
- (4) Aluminium sulphide

**Solution:2**

7. A NOT gate can be implemented by:

- (1) a single diode
- (2) two diodes
- (3) a single resistor
- (4) a single transistor

**Solution:4**

8. Article 1 of the Indian Constitution declares "India that is Bharat" is a:

- (1) Union of States
- (2) Federal State with Unitary features
- (3) Unitary State with federal features
- (4) Federal State

**Solution:1**

9. Plantation of trees on a large scale to check soil erosion are called:

- (1) Shelter belts
- (2) Contour ploughing
- (3) Strip cropping
- (4) Afforestation

**Solution:4**

10. Persistence of vision is the Principle behind:

- (1) Binocular
- (2) Cinema
- (3) Periscope
- (4) Camera

**Solution:2**

11. Thinner particles responsible for deteriorating the air-quality resulting in the damage of vital body organs are referred as PM:
- (1) 15.5
  - (2) 10.5
  - (3) 2.5
  - (4) 20.5

**Solution:3**

12. What is 'Milindapanho' ? –
- (1) A Buddhist place
  - (2) One of the names of Buddha
  - (3) A Buddhist Specimen of Art
  - (4) A Buddhist text

**Solution:4**

13. Of the following, in which did Napoleonic France suffer final defeat?
- (1) Battle of Trafalgar
  - (2) Battle of Wagram
  - (3) Battle of Pyramids
  - (4) Battle of Austerlitz

**Solution:1**

14. An example of protein which acts as a hormone is :
- (1) Trypsin
  - (2) Oxytocin
  - (3) Keratin
  - (4) Casein

**Solution:2**

15. The fat of a common mussel-secretes a sticky glue that can be used to make heart implants. The unique chemical compound present in the glue is:
- (1) Amino phenyl alanine
  - (2) Hydroxy phenyl alanine
  - (3) Phenyl alanine
  - (4) Dihydroxy phenyl alanine

**Solution:4**

16. Tick the correct option of GDP (Gross Domestic Product) contributed by service sector in the past:
- (1) During 2000-01 (GDP-65.54%)

- (2) During 1980 – 81 (GDP 50.00%)
- (3) During 1950 – 51 (GDP 34.63%)
- (4) During 2011 – 12 (GDP 57.00%)

**Solution:4**

17. Which was the first super computer purchased by India for medium range weather forecasting ?

- (1) CrayXMP-14
- (2) Medha – 930
- (3) CDC Cyber 930-11
- (4) Param

**Solution:1**

18. The study of population is called :

- (1) Cartography
- (2) Anthropology
- (3) Demography
- (4) Biography

**Solution:3**

19. Well preferred tree fossil supposed to be from Jurassic Age in India is reported from:

- (1) Pithauragarh
- (2) Chhattisgarh
- (3) Ramgarh
- (4) Bahadurgarh

**Solution:2**

20. The primary producer in an ecosystem are;

- (1) Women
- (2) Men
- (3) Plants
- (4) Bacteria

**Solution:3**

21. The Vice-President is:

- (1) A member of Lok Sabha
- (2) A member of Rajya Sabha
- (3) A member of either House
- (4) Not a member of the Parliament

**Solution:4**

22. In <HR>, the HR stands for:

- (1) Heading Regulations
- (2) Happy Romulans
- (3) Horizontal Rule
- (4) Horizontal Rulers

**Solution:3**

23. The Government of India Act, 1935 was based on :

- (1) Simon Commission
- (2) Lord Curzon Commission
- (3) Dimitrov Thesis
- (4) Lord Clive's report

**Solution:1**

24. Some of the ingredients required for bread making are:

- (1) Maida and Yeast
- (2) Maida and Baking Powder
- (3) Maida and Baking Soda
- (4) Maida and Ghee

**Solution:1**

25. Which one of the following hormone is called "Emergency Hormone" ?

- (1) Adrenaline
- (2) Thyroxine
- (3) Vasopressin
- (4) Insulin

**Solution:1**

26. Rajiv Gandhi International Airport is situated in :

- (1) Jammu and Kashmir
- (2) New Delhi
- (3) Mangalore
- (4) Hyderabad

**Solution:4**

27. Who founded the Indian National Party in Berlin during 1914?

- (1) Subhash Chandra Bose
- (2) W.C. Banerjee



(3) Surendranath Banerjee

(4) Champakaraman Pillai

**Solution:4**

28. Malaria is transmitted from one person to another by:

(1) Aedes Mosquito

(2) Culex Mosquito

(3) Anopheles Mosquito

(4) All of the above

**Solution:3**

29. Who was the head of the 10th Finance Commission ?

(1) Manmohan Singh

(2) Vasant Sathe

(3) Shiv-Shankar

(4) K.O Pant

**Solution:4**

30. In India, Special Economic Zones were established to enhance:

(1) Free trade

(2) Foreign Investment

(3) Employment

(4) Technology Development

**Solution:2**

31. Salal is the hydro power project in:

(1) Haryana

(2) Jammu and Kashmir

(3) Himachal Pradesh

(4) Punjab

**Solution:2**

32. During Quit India Movement, Parallel Government' was constituted at:

(1) Varanasi

(2) Allahabad

(3) Lucknow

(4) Ballia

**Solution:4**

33. Liver is a RICH source of :

- (1) sugars
- (2) fat soluble vitamins
- (3) minerals
- (4) proteins

**Solution:4**

34. Cuscuta is a :

- (1) Saprophyte
- (2) Epiphyte
- (3) Xerophyte
- (4) Parasite

**Solution:4**

35. In the case of an inferior good, the income elasticity of demand is :

- (1) Zero
- (2) Negative
- (3) Infinite
- (4) Positive

**Solution:2**

36. Nitrogen is an essential constituent of all :

- (1) Fats
- (2) Proteins
- (3) Vitamins
- (4) Carbohydrates

**Solution:2**

37. The Sargasso sea is situated in the :

- (1) Atlantic Ocean
- (2) Pacific Ocean
- (3) Indian Ocean
- (4) Arctic Ocean

**Solution:1**

38. Who discovered electromagnetic nature of light ?

- (1) Snell
- (2) Newton
- (3) Maxwell
- (4) Young

**Solution:3**

39. Judges of the district court are appointed by:

- (1) Governor
- (2) Chief Minister
- (3) Law Minister
- (4) President

**Solution:1**

40. The Poona Pact (1932) was an agreement between:

- (1) Nehru and Ambedkar
- (2) Gandhi and Ambedkar
- (3) Malaviya and Ambedkar
- (4) Gandhi and Nehru

**Solution:2**

41. Time of exposure required for taking photograph of an object depends upon the

- (1) brightness of the object
- (2) skill of photographer
- (3) proximity of object
- (4) size of the object

**Solution:1**

42. On which side did Japan fight in the First World War ?

- (1) none, it was neutral
- (2) with Germany against United Kingdom
- (3) against Russia on its own
- (4) with United Kingdom against Germany

**Solution:4**

43. The First India-Africa Forum Summit was held during 2008 at:

- (1) New Delhi
- (2) Tana
- (3) Bangalore
- (4) Addis Ababa

**Solution:1**

44. In which year the planning commission was set-up ?

- (1) 1950
- (2) 1951
- (3) 1952
- (4) 1949



**Solution:1**

45. "Rainbow Coalition" is a term derived from the politics and policies of ;
- (1) Pranab Mukherjee
  - (2) Barack Obama
  - (3) Mitt-Romney
  - (4) A.B.Vajpayee

**Solution:2**

46. The layer of the atmosphere in which Radio Waves are reflected back is called ;
- (1) Ionosphere
  - (2) Troposphere
  - (3) Stratosphere
  - (4) Exosphere

**Solution:1**

47. Who can impose reasonable restrictions over fundamental rights ?
- (1) Council of Ministers
  - (2) Parliament
  - (3) People
  - (4) Cabinet

**Solution:2**

48. The number of eggs normally released during one menstrual cycle is:
- (1) 3
  - (2) 2
  - (3) 1
  - (4) 4

**Solution:3**

49. Who won the "World Youth Chess Championship 2012" ?
- (1) N.Priyanka
  - (2) Kimi Raikkonen
  - (3) Scott Flemming
  - (4) M. Mahalakshmi

**Solution:**

50. The animal that do not develop hypertension inspite of heavy intake of salt is:
- (1) Sheep
  - (2) Buffalo

(3) Tiger

(4) Camel

**Solution:4**



## ENGLISH COMPREHENSION

**Directions (1-5) :** In the following questions, some of the sentences have errors and some have none. Find out which part of a sentence has an error. The number of that part is your answer. If there is no error, your answer is (4) i.e., No error.

1. Each one of you (1)/ must make up their mind (2)/ as I did. (3)/ No error (4).

**Solution:2**

2. Sudoku was first designed in the 1970s (1)/ by a retired architect (2)/ and freelance puzzle constructor, (3)/ No error (4).

**Solution:4**

3. During the last few years (1)/ the company works hard (2) / to modernise its image. (3)/ No en-or (4).

**Solution:2**

4. This stamp is only one (1)/ of the design (2)/ ever printed. (3)/ No error (4).

**Solution:2**

5. After he had apologised to the magistrate profusely (1)/ for having broke the promise (2)/ the magistrate was happy to forgive him. (3)/ No error (4).

**Solution:2**

**Directions (6-10) :** In the following questions, sentences are given with blanks to be filled with an appropriate word (s). Four alternatives are suggested for each question. Choose the correct alternative out of the four as your answer

6. What..... ? It..... wonderful.

- (1) is cooking, smell  
(2) is cooking, smelled  
(3) are you cooking, smelt  
(4) are you cooking, smells

**Solution:4**

7. We had .....money left, so we went out for a meal. We decided to abandon our trip as we had..... money left.

- (1) a little, a little  
(2) little, a little  
(3) a few, few

(4) a little, little

**Solution:4**

8. Please write to me..... this address.

(1) upon

(2) at

(3) to

(4) on

**Solution:2**

9. I hate him for the simple reason that he keeps singing his own praises continually talking about himself. He is an irritating..... . He is a real .....because for anything he does he always expects something in return, a selfish person indeed.

(1) Poser, Misanthrope

(2) Poser, Egotist

(3) Egoist Misanthrope

(4) Egotist. Egoist

**Solution:4**

10. On Tuesday it's the carnival,..... everybody gets dressed up in a fancy costume. So we will meet at John's house,..... is about a couple of kilometres away.

(1) which, where

(2) where, when

(3) when, where

(4) when, which

**Solution:4**

**Directions (11-13) :** In the following questions, out of the four alternatives, choose the one which best expresses the meaning of the given word as your answer.

11. Ingenuous

(1) innocent

(2) artful

(3) cunning

(4) clever

**Solution:1**

12. Innocuous

(1) careless

- (2) harmless
- (3) insufficient
- (4) irresponsible

**Solution:2**

13. Insolent
- (1) disrespectful
  - (2) insoluble
  - (3) depreciating
  - (4) the sole of a shoe

**Solution:1**

**Directions (14-16) :** In the following questions, choose the word opposite in meaning to the given word as your answer.

14. Overt
- (1) open
  - (2) complete
  - (3) hidden
  - (4) culvert

**Solution:3**

15. Diffidence
- (1) self-assurance
  - (2) expansiveness
  - (3) shyness
  - (4) sharpness

**Solution:1**

16. Amateur
- (1) novice
  - (2) professional
  - (3) lover
  - (4) apprentices

**Solution:2**

**Directions (17-21) :** In the following questions, four alternatives are given for the Idiom/Phrase printed in bold in the sentence, Choose the alternative which best expresses the meaning of the Idiom/Phrase.

17. He is known for **blowing his own trumpet**.
- (1) clattering



- (2) shouting
- (3) clamouring
- (4) boasting

**Solution:4**

18. He **cut the Gordian knot** by practising what he preached.

- (1) lessened the difficulty
- (2) let the difficulty remain as it was
- (3) removed the difficulty
- (4) add to the difficulty

**Solution:1**

19. He **took a leap in the dark** with his latest investment in stocks,

- (1) took a risk
- (2) was hesitant
- (3) was confused
- (4) was cocksure

**Solution:1**

20. Communicative English is the **Achilles' heel** for the job aspirants.

- (1) weak spot
- (2) source of strength
- (3) what they cherish most
- (4) top priority

**Solution:1**

21. He is leaving the USA for good.

- (1) urgently
- (2) permanently
- (3) temporarily
- (4) immediately

**Solution:2**

**Directions (22-31) :** In the following questions, a sentence/ part of the sentence is printed in bold. Below are given alternatives to the bold sentence/part of the sentence at (1), (2) and (3) which may improve the sentence. Choose the correct alternative. In case no improvement is needed, your answer is (4).

22. **They left the hotel by car where they had been staying.**

- (1) They left the hotel where they had been staying by car.
- (2) They left where they were staying in a hotel by car.



(3) In a car they left where they were staying in a hotel

(4) No improvement

**Solution:4**

23. Will you **lend me few rupees** in this hour of need ?

(1) lend me a little rupees

(2) borrow me a few rupees

(3) lend me a few rupees

(4) No improvement

**Solution:3**

24. Five years ago today, I **am sitting** in a small Japanese car, driving across Poland towards Berlin.

(1) was sitting

(2) sat

(3) have been sitting

(4) No improvement

**Solution:1**

25. He could not **look** anything in the dark room.

(1) look at

(2) see

(3) see through

(4) No improvement

**Solution:2**

26. No one could explain how a calm and balanced person like him could **penetrate** such a mindless act on his friends.

(1) perpetuate

(2) perpetrate

(3) precipitate

(4) No improvement

**Solution:2**

27. **Anyone who would speak** with authority on the poets of the Renaissance must have a broad acquaintance with the writers of classical antiquity.

(1) Anyone who will speak

(2) If one would speak

(3) Anyone desirous for speaking

(4) No improvement

**Solution:4**

28. He found **a wooden broken chair** in the room,  
 (1) wooden and broken chair  
 (2) broken wooden chair  
 (3) broken and wooden chair  
 (4) No improvement

**Solution:2**

29. The starving and crawling people in the television programme **looked** more like beasts than tiring creatures.  
 (1) posed  
 (2) resembled  
 (3) seemed  
 (4) No improvement

**Solution:2**

30. I took the cycle **which he bought yesterday**.  
 (1) that he bought yesterday.  
 (2) which he had bought yesterday.  
 (3) that he has bought yesterday.  
 (4) No improvement

**Solution:2**

31. Having only a few hours left, she wondered **as** she would finish the assignment.  
 (1) that if  
 (2) whether  
 (3) that  
 (4) No improvement

**Solution:2**

**Directions (32-38) :** In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentences.

32. A person who readily believes others.  
 (1) Credible  
 (2) Credulous  
 (3) Sensitive  
 (4) Sensible

**Solution:2**

33. The political leader **has an evil reputation**. He is not trusted.
- (1) is notorious
  - (2) is malicious
  - (3) is magnanimous
  - (4) is dubious

**Solution:4**

34. A person who helps even a stranger in difficulty
- (1) Samaritan
  - (2) altruist
  - (3) philanthropist
  - (4) beneficiary

**Solution:1**

35. Politicians are notorious for doing undue favour to their relatives.
- (1) pluralism
  - (2) nepotism
  - (3) dualism
  - (4) polarism

**Solution:2**

36. The production of raw silk.
- (1) sericulture
  - (2) seroculture
  - (3) sariculture
  - (4) syrumculture

**Solution:1**

37. Meaningless language with an exaggerated style intended to impress.
- (1) Orator
  - (2) Public speaking
  - (3) Verbalization
  - (4) Rhetoric

**Solution:4**

38. The conference takes place once in three years.
- (1) tetraenning
  - (2) triennial
  - (3) treennial
  - (4) thriennnial

**Solution:2**

**Directions (39-40) :** In the following questions, four words are given in each question, out of which only one word is correctly spelt. Find the correctly spelt word as your answer.

39. (1) Perjary  
(2) Perjury  
(3) Parjury  
(4) Perjery

**Solution:2**

40. (1) hetrogenous  
(2) heterogineous  
(3) heterogeneous  
(4) heterogeneious

**Solution:4**

**Directions (41-50) :** In the following questions, you have two passages with 5 questions in each passage. Read the passages carefully and choose the best answer to each question out of the four alternatives.

**PASSAGE-1****(Ques. Nos. 41 to 45)**

The Bengal Renaissance refers to a social reform movement during the nineteenth and early twentieth centuries in the region of Bengal in Undivided India during the period of British rule. The Bengal renaissance can be said to have started with Raja Ram Mohan Roy (1775-1833) and ended with Rabindranath Tagore (1861-1941), although there have been many stalwarts thereafter embodying particular aspects of the unique intellectual and creative output. Nineteenth century Bengal was a unique blend of religious and social reformers, scholars, literary giants, journalists, patriotic orators and scientists, all merging to form the image of a renaissance, and marked the transition from the 'medieval' to the 'modern'.

During this period, Bengal witnessed an intellectual awakening that is in some way similar to the European Renaissance during the 16th century, although Europeans of that age were not confronted with the challenge and influence of alien colonialism. This movement questioned existing orthodoxies, particularly with respect to women, marriage, the dowry system, the caste system and religion. One of the earliest social movements that emerged during this time was the Young Bengal movement, that espoused rationalism and atheism as the common denominators of civil conduct among upper caste educated Hindus. The parallel socio- religious movement, the Brahmo Samaj, developed during this time period and counted many of the leaders of the Bengal Renaissance among its



followers.

41. Find the option that is opposite in meaning to alien.
- (1) disputable
  - (2) indigenous
  - (3) unethical
  - (4) unscientific

**Solution:2**

42. The Bengal Renaissance was different from the 16th century European Renaissance because :
- (1) Europeans did not have the dowry system.
  - (2) Raja Rammohan Roy and Tagore were not born in the 16th century.
  - (3) The Bengal Renaissance was an essentially Hindu Movement.
  - (4) Unlike the Bengalis, Europeans were not under foreign rule.

**Solution:4**

43. "The spirit" of Renaissance:
- (1) is to embrace atheism
  - (2) is to get inspiration from Western-intellectual thought
  - (3) lies in breaking all shackles of backwardness and narrow mindedness
  - (4) is essentially scientific

**Solution:3**

44. The Bengal Renaissance movement:
- (1) wanted to overthrow colonialism
  - (2) wanted to propagate Brahmoism
  - (3) wanted social reform to improve the lot of the weak and the downtrodden
  - (4) none of the above

**Solution:3**

45. The Bengal Renaissance gathered momentum in the 19th century because :
- (1) the British had colonised India
  - (2) there was an abundance of intellectual and creative activities in Bengal then.
  - (3) the Brahmo Samai was formed
  - (4) Raja Rammohan Roy and Tagore lived at that time

**Solution:2**

## PASSAGE-II

### (Ques. Nos.46-50)

"I must find a hiding place," he thought, "and in the next few seconds or I am done

for.”

Scarcely had the thought crossed his mind that the lane took a sudden turning so that he found himself hidden from his pursuers. There are circumstances in which the least energetic of mankind learn to act with speed and decision. This was such an occasion for Rehmat Ali and those who knew him best would have been the most astonished at the lad's boldness. He stopped dead, threw the box or jewellery over a garden wall and, leaping upwards with incredible lightness, he seized the top of the walls with his hands and tumbled headlong into the garden.

46. Rehmat Ali is most likely :

- (1) a burglar
- (2) a policeman
- (3) a night watchman
- (4) a jogger

**Solution:1**

47. What kind of a person was Rehmat Ali originally ?

- (1) slow and steady
- (2) lazy and indecisive
- (3) reflective in nature
- (4) bold and decisive

**Solution:2**

48. The expression 'to stop dead' means:

- (1) to be paralysed
- (2) to come to a complete halt
- (3) to die suddenly
- (4) be close to death

**Solution:2**

49. Rehmat Ali found himself hidden from his pursuers because:

- (1) he had gone around an unexpected bend
- (2) his pursuers could not run fast enough
- (3) he had stopped dead
- (4) he had acted with speed and decision

**Solution:1**

50. There are circumstances in which the least energetic of mankind, learn to act with speed and decision, and the most cautious forget their care', Rehmat illustrates this by :

- (1) running away from his pursuers



(2) by stopping dead

(3) turning into a lane

(4) jumping into the garden

**Solution:4**



## QUANTITATIVE APTITUDE

1. If  $\left(\frac{3}{4}\right)^3 \left(\frac{4}{3}\right)^{-7} = \left(\frac{3}{4}\right)^{2x}$ , then  $x$

is :

- (1) -2
- (2) 2
- (3) 5
- (4) 2.5

**Solution:3**

$$(3) \left(\frac{3}{4}\right)^3 \times \left(\frac{4}{3}\right)^{-7} = \left(\frac{3}{4}\right)^{2x}$$

$$\Rightarrow \left(\frac{3}{4}\right)^3 \times \left(\frac{3}{4}\right)^7 = \left(\frac{3}{4}\right)^{2x}$$

$$\Rightarrow \left(\frac{3}{4}\right)^{10} = \left(\frac{3}{4}\right)^{2x}$$

$$\Rightarrow 2x = 10 \Rightarrow x = 5$$

2. Three numbers are in the ratio 1 : 2 : 3. By adding 5 to each of them, the new numbers are in the ratio 2 : 3 : 4. The numbers are:

- (1) 10, 20, 30
- (2) 15, 30, 45
- (3) 1, 2, 3
- (4) 5, 10, 15

**Solution:4**

- (4) Numbers =  $x$ ,  
 $2x$  and  $3x$

$$\therefore \frac{x+5}{2x+5} = \frac{2}{3}$$

$$\Rightarrow 4x + 10$$

$$= 3x + 15$$

$$\Rightarrow x = 5$$

$$\Rightarrow \text{Numbers} = 5, \\ 10 \text{ and } 15$$

3. If  $a^2 + b^2 + c^2 + 3 = 2(a - b - c)$ , then the value of  $2a - b + c$  is :

- (1) 3  
 (2) 4  
 (3) 0  
 (4) 2

**Solution:4**

$$(4) a^2 + b^2 + c^2 + 3$$

$$= 2a - 2b - 2c$$

$$\Rightarrow a^2 - 2a + 1 + b^2 + 2b + 1 + c^2$$

$$+ 2c + 1 = 0$$

$$\Rightarrow (a - 1)^2 + (b + 1)^2 + (c + 1)^2 = 0$$

$$\therefore a - 1 = 0 \Rightarrow a = 1$$

$$b + 1 = 0 \Rightarrow b = -1$$

$$c + 1 = 0 \Rightarrow c = -1$$

$$\therefore 2a - b + c = 2 + 1 - 1 = 2$$

4. A man buys 3 cows and 8 goats in 47,200. Instead if he would have bought 8 cows and 3 goats, he had to pay 53,000 more. Cost of one cow is:

- (1) 11,000  
 (2) 12,000  
 (3) 13,000  
 (4) 10,000

**Solution:2**

- (2) The C.P. of 1 cow = Rs.  $x$   
and that of a goat = Rs.  $y$ .

$$3x + 8y = 47200 \quad \dots(i)$$

$$8x + 3y = 100200 \quad \dots(ii)$$

By equation (i)  $\times 3$  - (ii)  $\times 8$ ,

$$9x + 24y - 64x - 24y$$

$$= 141600 - 801600$$

$$\Rightarrow 55x = 660000$$

$$\Rightarrow x = \frac{660000}{55}$$

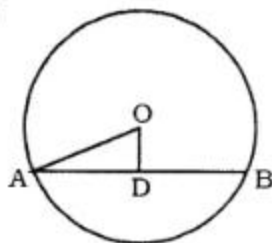
$$= \text{Rs. } 12000$$

5. A chord of length 30 cm is at a distance of 8 cm from the centre of a circle. The radius of the circle is:

- (1) 17  
(2) 23  
(3) 21  
(4) 19

**Solution:1**

(1)



$$AD = DB = 15 \text{ cm}$$

$$OD = 8 \text{ cm}$$

$$OA = \sqrt{15^2 + 8^2}$$

$$= \sqrt{225 + 64} = \sqrt{289}$$

$$= 17 \text{ cm}$$

6. Number of digits in the square root of 62478078 is:

- (1) 4
- (2) 5
- (3) 6
- (4) 3

**Solution:1**

(1) Number of digits in

62478078 = 8

∴ Number of digits in its  
square root = 4

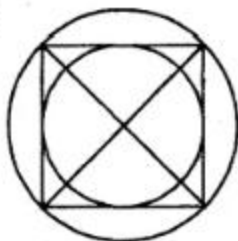
i.e.  $\sqrt{62478078} \approx 7904$

7. The ratio of inradius and circumradius of a square is :

- (1)  $1 : \sqrt{2}$
- (2)  $\sqrt{2} : \sqrt{3}$
- (3)  $1 : 3$
- (4)  $1 : 2$

**Solution:1**

. (1)



Radius of circum-circle

$$= \frac{\text{Diagonal}}{2} = \frac{\sqrt{2} \times \text{Side}}{2} = \frac{\text{Side}}{\sqrt{2}}$$

$$\text{Radius of in-circle} = \frac{\text{Side}}{2}$$

$$\therefore \text{Ratio} = \frac{\text{Side}}{2} : \frac{\text{Side}}{\sqrt{2}}$$

$$= 1 : \sqrt{2}$$

8. Out of 10 teachers of a school, one teacher retires and in his place, a new teacher of age 25 years joins. As a result, average age of teachers is reduced by 3 years. The age (in years) of the retired teacher is:

- (1) 58  
(2) 60  
(3) 55  
(4) 50

**Solution:3****(3) Age of retired teacher**

$$= 25 + 3 \times 10 = 55 \text{ years}$$

9. Evaluate:  $\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$

- (1) 1  
(2) -1  
(3) 2



(4) 0

**Solution:1**

$$(1) \tan 89^\circ = \tan (90^\circ - 1^\circ)$$

$$= \cot 1^\circ$$

$$\tan 88^\circ = \tan (90^\circ - 2^\circ)$$

$$= \cot 2^\circ$$

$$\therefore \text{Expression} = \tan 1^\circ \cdot \cot 1^\circ$$

$$\cdot \tan 2^\circ \cdot \cot 2^\circ \dots \tan 45^\circ$$

$$= 1$$

$$[\because \tan \theta \cdot \cot \theta = 1]$$

10. Equation of the straight line parallel to x-axis and also 3 units below x-axis is :

(1)  $x = -3$

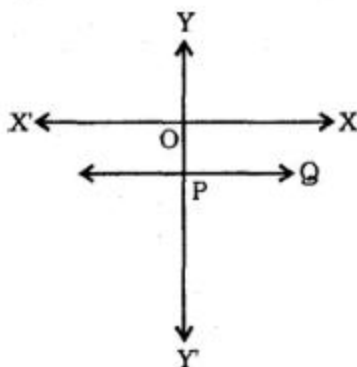
(2)  $y = 3$

(3)  $y = -3$

(4)  $x = 3$

**Solution:3**

(3)



Equation of a straight line  
parallel to x-axis :  $y = a$

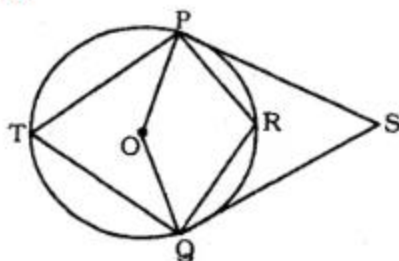
Here,  $a = -3$

$\therefore$  Equation is :  $y = -3$

11. P and Q are two points on a circle with centre at O. R is a point on the minor arc of the circle, between the points P and Q. The tangents to the circle at the points P and Q meet each other at the point S. If  $\angle PSQ = 20^\circ$ ,  $\angle PRQ = ?$
- (1)  $80^\circ$
  - (2)  $200^\circ$
  - (3)  $160^\circ$
  - (0)  $100^\circ$

**Solution:4**

(4)



$$\angle OPS = \angle OQS = 90^\circ$$

$$\angle PSQ = 20^\circ;$$

$$\therefore \angle POQ = 160^\circ$$

$$\therefore \angle PTQ = 80^\circ$$

PRQT is a concyclic quadrilateral.

$$\begin{aligned} \therefore \angle PRQ &= 180^\circ - 80^\circ \\ &= 100^\circ \end{aligned}$$

12. The value of a machine depreciates every year by 10%. If its present value is 50,000 then the value of the machine after 2 years is
- (1) 40,050
  - (2) 45,000
  - (3) 40,005
  - (4) 40,500

**Solution:**

(4) Required value

$$= 50000 \left( 1 - \frac{10}{100} \right)^2$$

$$= 50000 \times \frac{9 \times 9}{100}$$

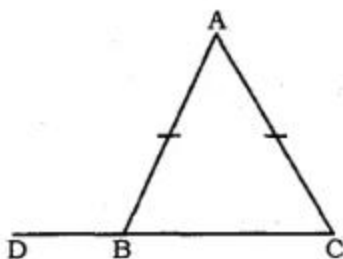
$$= \text{Rs. } 40500$$

13. In a triangle ABC, AB = AC,  $\angle BAC = 40^\circ$  Then the external angle at B is :

- (1)  $90^\circ$
- (2)  $70^\circ$
- (3)  $110^\circ$
- (4)  $80^\circ$

**Solution:3**

(3)



$$\angle ABC = \angle ACB$$

$$\angle BAC = 40^\circ$$

$$\therefore \angle ABC + \angle ACB = 140^\circ$$

$$\therefore \angle ABC = 70^\circ$$

$$\therefore \angle ABD = 180^\circ - 70^\circ = 110^\circ$$

14. A can finish a work in 18 days and B can do the same work in 5 days. B worked for 10 days and left the job. In how many days, A alone can finish the remaining work?

- (1) 6
- (2) 5.5

(3) 5

(4) 8

**Solution:1****(1) Work done by B in 10 days**

$$= \frac{10}{15} = \frac{2}{3}$$

$$\text{Remaining work} = 1 - \frac{2}{3} = \frac{1}{3}$$

**∴ Time taken by A**

$$= \frac{1}{3} \times 18 = 6 \text{ days}$$

15. A man can swim 3 km/hr. in still water. If the velocity of the stream is 2 km/hr., the time taken by him to swim to a place 10 km upstream and back is :

(1)  $9\frac{1}{3}$  hr.

(2) 10 hr.

(3) 12 hr.

(4)  $8\frac{1}{3}$  hr**Solution:3****(3) Rate downstream****= 5 kmph****Rate upstream = 1 kmph****∴ Required time**

$$= \frac{10}{5} + \frac{10}{1} = 12 \text{ hours}$$

16. It 10 men or 20 women or 40 children can do a piece of work in 7 months, then 5 men, 5 women and 5 children together can do half of the work in :
- (1) 6 months
  - (2) 4 months
  - (3) 5 months
  - (4) 8 months

**Solution:2**

(2) 10 men = 20 women

1 man = 2 women = 5 children

1 woman = 2 children

$\therefore$  5 men + 5 women + 5 children

= 20 + 10 + 5 = 35 children

$$\therefore M_1 D_1 = M_2 D_2$$

$$\Rightarrow 40 \times 7 = 35 \times D_2$$

$$\Rightarrow D_2 = \frac{40 \times 7}{35}$$

= 8 months

Required time = 4 months.

17. The value of  $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 177^\circ \cos 178^\circ \cos 179^\circ$  is :
- (1) 0

- (2)  $\frac{1}{2}$

- (3) 1

- (4)  $\frac{1}{\sqrt{2}}$

**Solution:1**

$$(1) \cos 90^\circ = 0$$

$$\therefore \cos 1^\circ \cdot \cos 2^\circ \dots \cos 179^\circ = 0$$

18. If  $p - 2q = 4$ , then the value of

$$p^3 - 8q^3 - 24pq - 64 \text{ is :}$$

(1) 2

(2) 0

(3) 3

(4) -1

**Solution:2**

(2)  $p - 2q = 4$

On cubing both sides,

$$(p - 2q)^3 = 64$$

$$\Rightarrow p^3 - 8q^3 + 3p \cdot 4q^2 - 3p^2 \cdot 2q = 64$$

$$\Rightarrow p^3 - 8q^3 + 12pq^2 - 6p^2q = 64$$

$$\Rightarrow p^3 - 8q^3 - 6pq(p - 2q) = 64$$

$$\Rightarrow p^3 - 8q^3 - 6pq \times 4 = 64$$

$$\Rightarrow p^3 - 8q^3 - 24pq - 64 = 0$$

19. If  $\sin \theta + \operatorname{cosec} \theta = 2$ , then the value of  $\sin^9 \theta + \operatorname{cosec}^9 \theta$  is :

(1) 3

(2) 2

(3) 4

(4) 1

**Solution:2**

(2)  $\sin \theta + \operatorname{cosec} \theta = 2$

$$\Rightarrow \sin \theta + \frac{1}{\sin \theta} = 2$$

$$\Rightarrow \sin^2 \theta - 2 \sin \theta + 1 = 0$$

$$\Rightarrow (\sin \theta - 1)^2 = 0$$

$$\Rightarrow \sin \theta = 1$$

$$\therefore \operatorname{cosec} \theta = 1$$

$$\therefore \sin^9 \theta + \operatorname{cosec}^9 \theta = 1 + 1 = 2$$



20. A shopkeeper marks the price of an article at 80. What will be the selling price, if he allows two successive discounts at 5% each ?
- (1) 72.2
  - (2) 72
  - (3) 85
  - (4) 7.2

**Solution:1**

(1) Single equivalent discount

$$= \left( 5 + 5 - \frac{25}{100} \right) \%$$

$$= 9 \frac{3}{4} = \frac{39}{4} \%$$

$$\therefore \text{S.P.} = 80 \times \frac{361}{400}$$

$$= \text{Rs. } 72.2$$

21. Which of the following successive discounts is better to a customer
- (a) 20%, 15%, 10% or
  - (b) 25%, 12%, 8% ?
- (1) (a) is better
  - (2) (b) is better
  - (3) (a) or (b) (both are same)
  - (4) None of these

**Solution:2**

(2) (a) Single equivalent discount for 20% and 15%

$$= \left( 20 + 15 - \frac{20 \times 15}{100} \right) \% = 32\%$$

Single equivalent discount for 32% and 10%

$$= \left( 32 + 10 - \frac{32 \times 10}{100} \right) \% = 38.8\%$$

(b) Single equivalent discount for 25% and 12%

$$= \left( 25 + 12 - \frac{25 \times 12}{100} \right) \% = 34\%$$

Single equivalent discount for 34% and 8%

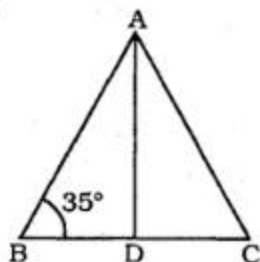
$$= \left( 34 + 8 - \frac{34 \times 8}{100} \right) \% \\ = 42 - 2.72 = 39.28\%$$

22. ABC is an isosceles triangle such that  $AB = AC$  and  $\angle B = 35^\circ$ . AD is the median to the base BC. Then  $\angle BAD$  is:

- (1)  $70^\circ$
- (2)  $35^\circ$
- (3)  $110^\circ$
- (4)  $55^\circ$

**Solution:4**

(4)



$$AB = AC$$

$$\therefore \angle ABC = \angle ACB = 35^\circ$$

$$\therefore \angle ADB = 90^\circ$$

$$\therefore \angle BAD = 55^\circ,$$

23. The degree measure of 1 radian

(taking  $\pi = \frac{22}{7}$ ) is

(1)  $57^\circ 61' 22''$  (approx.)

(2)  $57^\circ 16' 22''$  (approx.)

(3)  $57^\circ 22' 16''$  (approx.)

(4)  $57^\circ 22' 16''$  (approx.)

**Solution:2**

$$(2) \pi = \text{radian} = 180^\circ$$

$$\therefore 1 \text{ radian} = \frac{180^\circ}{\pi}$$

$$= \frac{180 \times 7^\circ}{22}$$

$$= \frac{630}{11} = 57 \frac{3}{11}^\circ$$

$$= 57^\circ \frac{3}{11} \times 60' = 57^\circ \frac{180'}{11}$$

$$= 57^\circ 16' \frac{4}{11} \times 60'' = 57^\circ 16' 22''$$

24. A train moving at a rate of 36 km/hr. crosses a standing man in 10 seconds. It will cross a platform 55 metres long, in :

(1) 6 seconds

(2) 7 seconds

(3)  $15\frac{1}{2}$  seconds

(4)  $5\frac{1}{2}$  seconds

**Solution:3**

(3) Speed of train = 36 kmph

$$= 36 \times \frac{5}{18} = 10 \text{ m/sec}$$

Length of train =  $10 \times 10$

= 100 metre

$$\therefore \text{Required time} = \frac{100 + 55}{10}$$

= 15.5 seconds

25. If  $\left(n^r - t n + \frac{1}{4}\right)$  be a perfect square, then the values of  $t$  are:

(1)  $\pm 2$

(2) 1, 2

(3) 2, 3

(4)  $\pm 1$

**Solution:4**

(4) For  $n^2 - tn + \frac{1}{4}$  to be a perfect square,  
 $r = 2$  and  $t = \pm 1$

**Look :**

$$n^2 - n + \frac{1}{4} = n^2 - 2 \cdot n \cdot \frac{1}{2} + \frac{1}{4}$$

$$= \left( n - \frac{1}{2} \right)^2$$

$$n^2 + n + \frac{1}{4} = n^2 + 2 \cdot n \cdot \frac{1}{2} + \frac{1}{4}$$

$$= \left( n + \frac{1}{2} \right)^2$$

26. If  $\frac{x}{a} = \frac{1}{a} - \frac{1}{x}$ , then the value of  $x - x^2$  is :

(1)  $-a$

(2)  $\frac{1}{a}$

(3)  $-\frac{1}{a}$

(4)  $a$

**Solution:**4

$$(4) \frac{x}{a} = \frac{1}{a} - \frac{1}{x}$$

$$\Rightarrow \frac{x}{a} = \frac{x-a}{ax}$$

$$\Rightarrow x^2 = x-a$$

$$\Rightarrow x - x^2 = a$$

27. If  $\triangle ABC$  is similar to  $\triangle DEF$  such that  $BC = 3$  cm,  $EF = 4$  cm and area of  $\triangle ABC = 54$   $\text{cm}^2$ ,

(1)  $66 \text{ cm}^2$

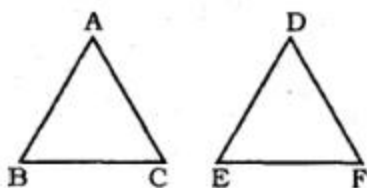
(2)  $78 \text{ cm}^2$

(3)  $96 \text{ cm}^2$

(4)  $54 \text{ cm}^2$

**Solution:3**

∴ (3)



$$\triangle ABC \sim \triangle DEF$$

$$\therefore \frac{\Delta ABC}{\Delta DEF} = \frac{3^2}{4^2} \Rightarrow \frac{54}{\Delta DEF} = \frac{9}{16}$$

$$\Rightarrow \Delta DEF = \frac{16 \times 54}{9}$$

$$= 96 \text{ sq.cm.}$$

28. On selling an article for ! 170, a shopkeeper loses 15%. In order to gain 20%, he

must sell that article at rupees:

- (1) 215.50
- (2) 212.50
- (3) 240
- (4) 210

**Solution:3**

$$\therefore (3) \text{ C.P. of article} = \frac{170 \times 100}{85}$$

$$= \text{Rs. } 200$$

$$\therefore \text{ Required S.P.} = \frac{200 \times 120}{100}$$

$$= \text{Rs. } 240$$

29. The time in which 80,000 amounts to 92,610 at 10% p.a. at compound interest, interest being compounded semi annually is :

- (1) 1.5 years
- (2) 2 years
- (3) 2.5 years
- (4) 3 years

**Solution:1**

$$(1) \text{ Time} = t \text{ half year}$$

$$= R = 5\% \text{ per half year}$$

$$\therefore A = P \left( 1 + \frac{R}{100} \right)^T$$

$$\Rightarrow \frac{92610}{80000} = \left( 1 + \frac{5}{100} \right)^T$$

$$\Rightarrow \frac{9261}{8000} = \left( \frac{21}{20} \right)^T$$

$$\Rightarrow T = 3 \text{ half years}$$

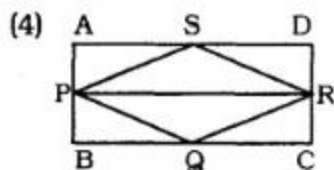
$$\Rightarrow \left( \frac{21}{20} \right)^3 = \left( \frac{21}{20} \right)^T$$



30. If ABCD be a rectangle and P, Q, R, S be the mid points of  $\overline{AB}$ ,  $\overline{BC}$ ,  $\overline{CD}$  and  $\overline{DA}$  respectively, then the area of the quadrilateral PQRS is equal to:

- (1) area (ABCD)
- (2)  $\frac{1}{3}$  area (ABCD)
- (3)  $\frac{3}{4}$  area (ABCD)
- (4)  $\frac{1}{2}$  area (ABCD)

**Solution:4**



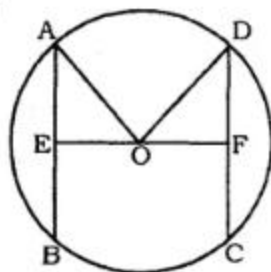
$$\Delta PSR = \Delta APS + \Delta SDR$$

$$\Delta PQR = \Delta PBQ + \Delta QCR$$

31. AB and CD are two parallel chords of a circle such that AB = 10 cm and CD = 24 cm. If the chords are on the opposite sides of the centre and distance between them is 17 cm, then the radius of the circle is :
- (1) 11 cm
  - (2) 12 cm
  - (3) 13 cm
  - (4) 10 cm

**Solution:3**

(3)



$$AB = 10 \text{ cm, } AE = 5 \text{ cm}$$

$$OE = x$$

$$CD = 24 \text{ cm, } DF = 12 \text{ cm}$$

$$OF = 17 - x$$

$$OA = OD$$

$$\Rightarrow 5^2 + x^2 = 12^2 + (17 - x)^2$$

$$\Rightarrow 25 + x^2 = 144 + 289 - 34x + x^2$$

$$\Rightarrow 34x = 408$$

$$\Rightarrow x = \frac{408}{34} = 12$$

$$\therefore OA = \sqrt{5^2 + 12^2} = 13 \text{ cm}$$

32. The average of 50 numbers is 38. If two numbers namely 45 and 55 are discarded, the average of the remaining numbers is :

- (1) 35
- (2) 32.5
- (3) 37.5
- (4) 36

**Solution:**3

(3) Required average

$$= \frac{38 \times 50 - 45 - 55}{48}$$

$$= \frac{1800}{48} = 37.5$$