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**Indian Institute of Management Indore**
**Five-Year Integrated Programme in Management (IPM)**

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## Quantitative Ability (MCQ)

1. A red light flashes 3 times per minute, green light flashes 4 times per minute and yellow light flashes 6 times per minute at regular intervals. If all three lights start flashing at the same time, how many times do they flash together in each 75 minutes?
   a) 60 b) 65 c) 70 d) 75

2. A bag contains a total at 105 coins of Rs. 1, 50 paise and 25 paise denominations. Find the total number of coins of Rs. 1 if there are a total of 50.50 rupees in the bag and it is known that the number of 25 paise coins is 133.33% more than the number of Rs. 1 coins.
   a) 48 b) 18 c) 24 d) 27

3. A bag has 6 blue balls, 8 red balls, 5 black balls and 9 white balls. You are asked to pick some balls from the bag, without looking into the bag. What is the minimum number of balls you must pick so as to be sure that at least 3 of them are of the same color?
   a) 5 b) 8 c) 9 d) 11

4. $\frac{x^2+x+1}{x+1} = \frac{x}{a+1}$ $x$ is real if

   a) $\frac{4}{3} \geq a \geq 0$ b) $a \geq 0$ c) $-\frac{4}{3} \leq a \leq 0$ d) $\frac{2}{3} < a < 1$

5. An empty metal container (without its handle) weight 15% of its weight when filled with a particular liquid. After adding the handle, the weight of the fully filled container increases by 5%. If the weight of a partly filled container is 1/3 of the completely filled container with handle attached, then what fraction of container is utilized?
   a) 4/17 b) 3/17 c) 6/19 d) 3/19

6. One kilogram of laddoo mix packet costs Rs. 150/- usually and can be used to make 100 laddoos. A festive offer is launched with 20% extra material in each packet and at 10% price discount. Last month, Ram bought enough packets to make 6000 laddoos when no offer was available. This month, during the festive offer, shyam bought enough packets to make 6000 laddoos. The ratio of amount spent by shyam to the amount spent by Ram is
   a) 1:3 b) 1:2 c) 2:3 d) 3:4

7. Four women and one man plan a robbery and decide to share the spoils equally. However, on the night of the robbery, the man falls sick. While the robbery is successful, the man gets only half of the share he was entitled to. Then, the ratio of amount of money shared by the women to the original share they were entitled to is
   a) 7:6 b) 8:7 c) 9:8 d) 10:9

8. The economy of Xiberia consists of exactly two industries: mining and manufacturing. It was expected that the economy would grow by 18% if mining grew by 10% and manufacturing by 20%. However, if manufacturing grew only by 10%, then, for the economy to still grow by 18%, mining needs to grow by what %?
   a) 25 b) 37.5 c) 50 d) 62.5

9. Fig. 1 consists of a circle C with centre O. OA and OB are perpendicular to each other. The area of the triangle AOB is 32 square units.
   If AD = BD, the area of the triangle ABD is

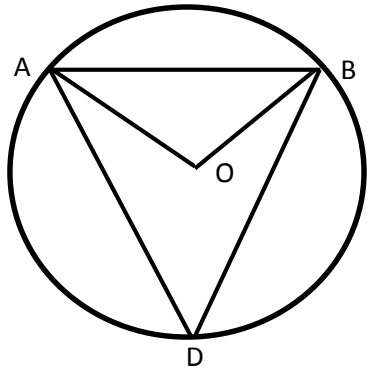


Fig.1

a) $32\pi$ Square units
b) $32\left(1+\sqrt{2}\right)$ Square units
c) $64\sqrt{2}$ square units
d) $64$ square units

10. If $log_3 2, log_3(2^x-5)$ and $log_3\left(2^x-\frac{7}{2}\right)$ are in Arithmetic Progression, then x is equal to

a) 2 b) 3 c) 2 or 4 d) 2 or 3

11. In the sequence 1,2,2,3,3,3,4,4,4,4, ……where n consecutive terms have the value n, the 150$^{th}$ term is

a) 17 b) 16 c) 18 d) 15

12. If (1 –p) is a root of the quadratic equation $x^2+px+(1-p)=0$, then its roots are

a) p and –p b) 0 and 1 c) 0 and -1 d) -1 and p

13. The number of different six digit numbers, the sum of whose digits is odd is

a) $\frac{10C_6}{2}$ b) $6!\times 10C_6$ c) 9 X $10^5$ d) 45 x $10^4$

14. Let A be a set with 3 elements and B be a set with 4 elements. The total number of one-one functions from A to B is.

a) 64 b) 81 c) 24 d) 48

15. Domain of definition of the function $f(x)=\frac{3}{9-x^2}+log_{10}(x^3-x)$ is

a) $(-1,0)\cup(1,3)$
b) $(-\infty,-3)\cup(-3,3)\cup(3,\infty)$
c) $(-3,0)\cup(3,\infty)$
d) $(-1,0)\cup(1,3)\cup(3,\infty)$

16. A computer has 3 ports to transfer data into flash-drives. The rate of data transfer varies as the simultaneous transfers change as follows:
Single transfer means data transfer @ 3 MB per second
Two simultaneous transfers mean data transfer@ 2 MB per second for each transfer
Three simultaneous transfers mean data transfer @ 1.5 MB per second for each transfer
Rohit has to transfer 577 MB data into three flash-drives of data-holding capacity of 90 MB, 200MB and 300MB respectively. What is the shortest possible time to perform this transfer?

a) 144 seconds
b) 128 seconds
c) 96 seconds
d) 64 seconds

17. Two boats in a current-free lake start sailing towards each other from a distance of 140 kilometres. At the same time, a fish touches boat A and swims towards boat B. As soon as it touches boat B, it swims back to boat A. The process continues till the boats collide. The boats sail at a constant speed of 16 kilometres per hour and 12 kilometres per hour. The fish swims at the constant speed of 5 kilometres per hour. After swimming for 40% of the total time between start and collision, the fish gets tired and reduces the speed to 3 kilometres per hour. What would be the total distance swam by the fish till the boats collide?

a) 25km b) 23km c) 19 km d) 16 km

**Questions 18 to 20** : For the year 2016, Sid has taken a New Year resolution for being very fit. Therefore, starting with January 1, 2016, he has decided to go for swimming every second day gym every third day and jogging every fifth day. The three activities are very energy intensive and require, respectively, 130 calories, 140 calories, 110 calories. If January 1, 2016 happens to be a Sunday, answer the following questions.

18. On how many days, does Sid go to jog only?

a) 73 b) 74 c) 48 d) 25

19. On how many days, does Sid not go for any of the three activities?

a) 95 b) 96 c) 97 d) 98

20. What is the amount of total calories spent by Sid over all such days, when he did all the three activities?

a) 4560 calories b) 4280 calories c) 3800 calories d) 3600 calories

21. If A = $\{x \mid 3(1-x) < 2(x-2), x \in N\}$ *and* $B = \{x \mid 5 > 4(x-3), x \in W\}$

The smallest element and the number of elements of the set $A \cap B$ will be respectively

a) 2 and 3 b) 3 and 3 c) 1 and 4 d) 3 and ∞

22. If A is a root of the equation : x(2x+5) = A. The values of A

a) are rational number $\leq 0$ b) are rational numbers $> 0$

c) are irrational numbers d) are not real numbers

23. If $f(x) = 24x^3 + px^2 - 5x + q$ has two factor $(2x+1)$ and $(3x-1)$, the value of p must be

a) 2 b) 1 c) 0 d) -2

24. Two chords, KL and MN of a circle intersect at an external point J. If KL = 15 cm. L J = 5cm, MN = 21 cm and NJ = 4 cm, the ratio of the area of the quadrilateral KLNM to the area of the triangle JKM will be

a) $\frac{24}{25}$ b) $\frac{22}{25}$ c) $\frac{17}{20}$ d) $\frac{19}{20}$

25. The number of ways in which five balls each of different color can be distributed to three different persons such that each person gets at least one ball is
a) 90 b) 120 c) 150 d) 180

26. The distance between the two planes $2x + y + 2z = 8$ and $4x + 2y + 4z = -5$ is
a) $\frac{9}{2}$ b) $\frac{7}{2}$ c) $\frac{5}{2}$ d) $\frac{3}{2}$

27. An unknown polynomial is divided by x – 1 to give a remainder 2 and with x – 2 to give a remainder 1. Then the remainder resulting when the same polynomial is divided by (x – 1)(x – 2) is
a) 2 – x b) 1 – x c) 4 – x d) 3 – x

28. The sum of the first twenty terms of the sequence 0.7, 0.77, 0.777, ….is
a) $\frac{7}{81}(179 - 10^{-20})$ b) $\frac{7}{9}(99 - 10^{-20})$ c) $\frac{7}{81}(179 + 10^{-20})$ d) $\frac{7}{9}(99 + 10^{-20})$

29. Consider the equations $x^2 + 2x + 3 = 0$ and $\propto x^2 + \beta x + \gamma = 0$, where $\propto, \beta, \gamma \epsilon R$. If these equations have one root in common then $\propto : \beta : \gamma$ is equal to
a) 1:2:3 b) 3:2:1 c) 1:3:2 d) 3:1:2

30. The value of $6 + log_{\frac{1}{2}} \left( \frac{1}{3\sqrt{2}} \sqrt{4 - \frac{1}{3\sqrt{2}} \sqrt{4 - \frac{1}{3\sqrt{2}} \sqrt{4 - \frac{1}{3\sqrt{2}}} \ldots} \right)$ is
a) 8 b) 4 c) 2 d) 10

## Verbal Ability (MCQ)

**Questions 1 to 3** : The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a number. Choose the most logical order of the sentences from the choices given.

1. 1. She monitors the pygmy nuthatches that nest in her backyard, and shares bird count data to help track the health of bird populations in North America.
2. It's time we took time to do our bit to celebrate all that nature provides.
3. The food we eat, the water we drink, the air we breathe- it all comes from nature
4. We need more people like Christine Haines, a nature photographer and a member of The Nature Conservancy, who do their bit to help protect the environment.

a) 4123 b) 3241 c) 4231 d) 3421

2. 1. At the Special School for the Blind in Gurgaon, computers and Braille type notes have made learning much easier.

2. What recent devices have done is to help take it further.

3. Braille, the tactile writing system for the blind developed in the 19th Century remains the bedrock of many innovations.

4. With the aid of a type note – which has a key corresponding to each of the six dots of the Braille Code – visually-impaired children can take notes as fast as sighted children.

a) 4213 b) 1432 c) 3214 d) 1243

3. 1. To walk in the world's poorer countries in to enter the orbit of their inhabitants.

2. Time slows down and geography stretches out.

3. The unhurried pace brings a sense of things restored to their natural proportions.

4. The details of the land- its small topographical changes, its chance noises and scents – become more potent and absorbing.

5. The choice to travel on foot is a transforming one.

a) 53241 b) 12534 c) 34125 d) 15324

**Questions 4 and 5** : Each of the paragraphs given below has a sentence missing which is indicated by a blank. From the choices given below each paragraph, choose the sentence that seems most logically appropriate to complete the given paragraph.

4. Jhumpa Lahiri's The Interpreter of Maladies established this young writer as one of the most brilliant of her generation._____. In The Namesake Lahiri enriches the themes that made her collection an international bestseller. Her novel, like the stories, deals with the immigrant experience, the clash of cultures and the conflicts of assimilation, and, most poignantly, the tangled ties between generations.

a) Her unusual quality as a writer has not been acknowledged.

b) Her language, style and themes are difficult to understand.

c) Her stories are one of the few debut works to win the Pulitzer Prize for fiction.

d) Her stories depict Americans and the American way of life.

5. It takes two to tango but one to travel. Travel alone you must, as that last ritual to get comfortable in your own skin, to be attentive to what goes on in your head and to know what your heart wants._____. Plan your travel to arrive at your destination at daytime; preferable pre-book a cab or find out exact bus route and timings from the airport. Any place that has a reputation for treating women as chattel, should be avoided. At best, dress conservatively.

a) However, do not accept fraudulent bookings in hotels from touts at the airport.

b) If, as a woman, you are traveling alone you need to strategies to stay safe.

c) Although the journey that you undertake would prove less risky, being in a group

d) Never hesitate; always ask for directions from friendly looking strangers

**Questions 6 to 9** : Read the following passages and answer the questions given below each.

The Navy is seeking a way to do underwater what the Air Force has been doing in the sky: prowl stealthily for long periods of time and gather the kind of data that could turn the tide in war. But in a new twist, the Navy has found a way to power an eventual fleet of submersible drones from the ocean itself, increasing deployment times and cutting fuel costs.

The drone changes density in response to the outside water, causing the 5 ft-long (1.5 m) torpedo-like vessel to rise or sink through the ocean's thermoclines, or bands of warm and cool water, at and below its surface. The stubby winds translate some of that up-and-down motion into a forwards sawtooth-like path at about a mile an hour (1.6 km/h).

Much of the work such gliders do is oceanographic, collecting data about water temperature and currents. The drone transmits such information – used to generate better sonar images – to headquarters by sticking its tail- borne antenna out of the water. But the drones are also being enlisted to scout enemy coastlines, where they could help the Navy hunt down minefields and target subs without putting sailors at risk.

6. For which one of the following will the drones **not** be useful to the Navy?

   a) surveillance

   b) drilling

   c) security of personnel

   d) improved sound navigation range

7. An innovative positive development the drone brings is its ability to

   a) carry out torpedo attacks

   b) glide gracefully on the water surface

   c) adapt to differences in water temperature

   d) send out powerful information.

8. The expression 'turn the tide in war' means

   a) reduce the dangers of violent oceanic movement

   b) change possible defeat to possible victory

   c) identity hidden enemy locations

   d) be instrumental in winning the war

9. Even when the country is not at war, the Navy can make good use of the drone because it is able to

   a) gather and convey accurate oceanic information

b) zigzag in any direction under the ocean

c) transform itself into an underwater plane

d) keep enemies away with its torpedo-like body

**Questions 10 and 11 :** Complete the following sentences by choosing the correct phrase/clause from those given below each.

10. Unless he_____he will not be allowed to watch television.

a) does not finish his homework

b) will finish his homework

c) will not finish his homework

d) finishes his homework

11. The accused wanted to know_____detained.

a) why had he been

b) why he had been

c) for what reason was he

d) for which reason was he



**Questions 12 and 13** : In each of the sentences, a part or the entire sentence is underlined. Choose the alternative from the four options, so that the given sentence is correct.

12. It is no doubt that the rich have a great advantage

a) It is no doubt that the rich have a great advantage
b) It has no doubt that the rich have a great advantage
c) There is no doubt that the rich have a great advantage
d) There has no doubt that the rich have a great advantage

13. He agreed to give her the half of the money.

a) to give her the half of the money

b) to give her a half of the money

c) to give her half of the money

d) to give her an half of the money

**Questions 14 and 15 :** In each of the options the following words are used in different ways. Choose the option where the usage is incorrect or inappropriate.

14. **Loose**

a) He went to the dentist because of a loose tooth

b) the cyclone caused some of the roof tiles to come loose

c) Her friend does not approve of her loose morals

d) The scam caused many people to loose their life savings

15. **Effect**

a) The criticism did not effect the student at all

b) One cannot say what effect computerisation will have on the service

c) Increasing levels of pollution will have a disastrous effect on planet earth

d) The teacher's stern lecture had no effect on the student's behaviour

**Questions 16 and 17 :** The sentences below have words that are missing. Choose the best option from those below to complete the sentence.

16. Governments frame laws and regulations to steer business_____in what they _____to be beneficial directions.

a) ethics; believemeetings; agree

b) behaviour; perceive

c) people; consider

17. Written records give little indication of the way in which Shakespeare's professional life moulded his artistry. All that can be _____is that over the course of 20 years, Shakespeare wrote plays that_____the complete range of human emotion and conflict.

a) ascertained; expand

b) said; violate

c) expected; kindle

d) deduced; capture

**Question 18 :** In following question, a related pair of words is followed by four words. Select the word that best expresses a relationship similar to that expressed in the given word e.g. Dramaturgy - Plays

18. Ocean - ?

a) Tributary
b) Tides
c) Icebergs
d) Vessel

**Question 19** : Choose the option **closest in meaning** to the following word.

19. Salient

a) most prominent

b) very aggressive

c) most sensitive

d) very convenient

**Question 20** : Choose the option that is **closely opposite in meaning** to the following word.

20. Attractive

a) rude b) repellent c) genteel d) crude

## Quantitative Ability-Short Answer type questions (SA)

**Instructions - Read the question and enter the answer in the box / space provided**



**Question 1:** The shortest distance between a point on the line $3x + 4y + 14 = 0$ and a point on the circle $(x-1)^2 + (y-2)^2 = 4$ is _____.

**Question 2:** A solid metallic *spherical* ball is melted to make 250 identical solid metallic *hemispherical* balls. If the original metallic ball requires 10 litres of colour to be painted on its surface, then _____ litres of colour would be required to paint all the 250 *hemispherical* balls.

**Question 3:** Sum of the roots of the equation $y^2 + |y-1| - 1 = 0$ is _____.