THE TIMES OF INDIA
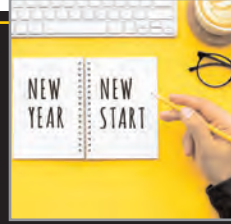
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HAPPY New Year 2021

TODAY'S EDITION

► We are back with the sample question papers. This week, we bring you maths and economics question papers **PAGE 2** ►

► When done correctly, making resolutions can shape our behaviour for the better. Here is a list that you could try for 2021! **PAGE 3** ►

► 6 life lessons from India's stunning victory against Australia at Melbourne **PAGE 4** ►

STUDENT EDITION
Times nie
Newspaper in Education

FRIDAY, JANUARY 1, 2021

WEB EDITION

CLICK HERE: PAGE 1 AND 2

2020 was a year that everyone would want to delete from their memories. The Covid-induced lockdown forced shutdowns in all sectors globally. Technology changed. The education systems changed. We shifted to a new lifestyle. Masks became a part of our lives. But, it also tested our resilience. We pulled together to battle a pandemic, and learnt a few lessons. As the New Year rings in, there's hope that we will embrace and nurture from the learnings from 2020 and begin with a new zeal. A snap shot of how we may fare this year...

2021: LET'S START OVER AGAIN!

EDUCATION

Internet of Things (IoT) to dominate

If experts are to be believed, the year will see a remarkable change in our educational system. Traditional chalk, blackboard, pens and paper in the classroom will be replaced with the Internet of Things(IoT)—a term that is being used to define physical items connected to the world wide web. Phones, tablets and computers will be used more to enable better communication between students and teachers. Futuristic technology solutions represented by interactive displays, like Promethean, learning environments seen with blackboard, and campus tools like Magicard, among many others, will rule the roost. Artificial Intelligence(AI) will be be utilised to transform components like testing and grading. Automated algorithms will come to the rescue of the teachers in saving time by checking assignments faster than it takes for any human.

ECONOMY

Digital economy will get a big boost

It is expected that the post-covid world will be far more digital. From remote working to online retail, the pandemic has compressed years' worth of transformation into months, bringing with it a dramatic shake-up in how people live, what they buy and where they work. Winners from this bout of creative destruction include the tech giants and large companies, as they have the biggest troves of data and the deepest pockets to invest in digital transformation. Also, it is believed that big cities may have to reinvent themselves. Though globalisation will still be in place, there will be less travel by people.

TECHNOLOGY

Focus on anything that makes us feel safer

This year technology and innovation will focus on products and services that make us feel safer, predict tech experts for obvious reasons. From pulse oximeters used in checking our blood oxygen levels to find out how serious our illness is to Apple's smart watch that can detect blood oxygen levels—which became popular during the pandemic times—gadgets of this genre will be invented more, say experts. Similarly, electrostatic sprayer used for cleaning aeroplanes, voice-activated smartphones that let responders communicate without removing their personal protective equipment, and security cameras that can map whether people are social distancing, will gain prominence.

CORPORATE CULTURE

Servant-leadership (a philosophy in which the goal of a leader is to serve) will have an edge

As we strive to overcome an economic recession, experts feel the character of the leaders will matter as much as their competence. They reason, in the face of threats to jobs and lives, people tend to become more concerned about precarity and purpose. They look for a sense of confidence that their jobs are secure and a sense of contribution to a cause larger than themselves. This will give servant-leaders an edge in recruiting, motivating and retaining talented people.

URBAN INFRASTRUCTURE

Blueprint of cities will be altered

The pandemic has changed the face of the cities, remodelling them in ways that will make urban life more sustainable, believe many. Lockdowns gave working from home-proof concept, challenging the notion that cities need to be divided into separate areas for working and living. Experts say there will be a surge in bicycle lanes, and other temporary infrastructure changes will be implemented to improve city life, amid the pandemic.

Photo: Getty Images
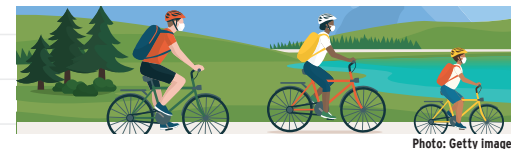
CALCULATIVE INVESTMENTS

Millennials to change the rule

Millennials—born between 1981 and 1996—are about to enter the peak earning years of their careers. As they climb the corporate ladder and replace retiring baby boomers, their earning power will jump by almost 75% this decade, according to Bank of America research. Younger generations want more than just a financial return when they invest. The investment industry will, therefore, be forced to adapt in order to follow the money, meaning there will be more mergers and acquisitions, fintech partnerships, and an influx of tech-minded talent, predict experts.
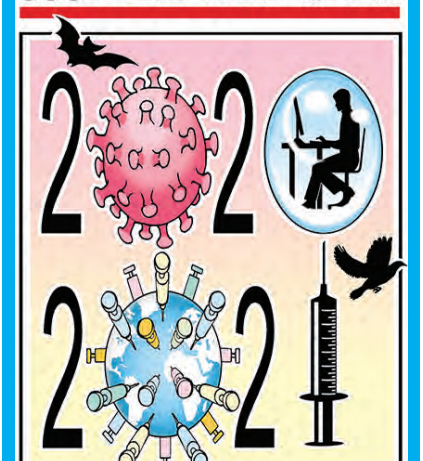

NEWS IN CLUES

Which is India's largest rubber-producing state?

CLUE 1: Arif Mohammad Khan is its current governor
CLUE 2: It was the first state to move the Supreme Court challenging the CAA
CLUE 3: It is also home to India's oldest mosque — the Cheraman Juma Masjid

ANSWER: KERALA. The state's capital city Thiruvananthapuram has pulled off a mayoral first, as 21-year-old college student **Arya Rajendran** takes on the mantle. She will be India's youngest mayor

JUST LIKE THAT AJIT NINAN

2020 2021

Happy Twenty Twenty Won

We hope...

I pray that 2021 gives people the strength to find a closure to heal the wounds created last year, and life limps back to normal. I wish, those who struggled with school and exams, find the endurance to make it through the check-point.
HINA NAELA, class XII, G D GOENKA PUBLIC SCHOOL, Lucknow

I wish to return to my offline classroom with all my friends, and enjoy the last few months of my school life with zeal and enthusiasm.
RUPAM SHUKLA, class XII, Sunrise English Medium School, Kolkata

I hope our lives become normal again! Like others, let's pray that the Covid vaccine works efficiently, and we get back to our normal schedule without any fear.
RAKSHIT DUBEY, class IX, Zebar School for Children, Ahmedabad

It would be great, if students across the world manage to resume their classes and studies normally (like in the pre-Covid times) this year. A hassle-free life without any Covid restrictions, is all that I want this year.
SANYA SINHA, class XII, Manav Rachna International School, Faridabad

I wish to rediscover my passion and determination once again! Last year was quite unconventional with strange experiences. There was a general decline in productivity. I just hope to channelise my energy in right direction.
LIKHITH L GOWDA, class X, DPS, North, Bengaluru

INTO THE FUTURE

Japan to launch first wooden satellite by 2023

Wooden satellites, which burn completely on atmospheric re-entry without releasing harmful aluminium-rich particles, are being developed in Japan.

DID YOU KNOW

WHY WOODEN SATELLITE

► According to researchers, not only would wooden satellites be better for the environment, they will also go a long way in paving new and simpler designs, if used to make a craft's outer shell

► Since electromagnetic signals pass more easily through wood, scientists said, the antennas could be placed within rather than outside the satellite body

► The Japanese team of experts have also revealed that their first wooden satellite will be ready to launch into space by the year 2023

► At present, space satellites are typically made up of aluminium and its alloys, as the metal is relatively cheap, lightweight and durable

► Though aluminium-based components have the benefit of being able to withstand both extremes of temperature and bombardment by space radiation, they add to the thousands of space junk around the Earth, if they are left in orbit, becoming a hazard to other satellites and rockets

EVALUATE YOUR PLUS & MINUS POINTS IN MATHS

Exams R fun

CLASS: X - 2020-21

SUBJECT: Mathematics

Time Allowed: 3 Hours

Maximum Marks: 80

GENERAL INSTRUCTIONS

1) This question paper contains two parts A and B.

2) Both Part A and Part B have internal choices.

Part - A: 1) It consists of three sections - I and II.

2) Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.

3) Section II has 4 questions on case study.

Each case study has 5 case-based sub-parts.

An examinee is to attempt any 4 out of 5 sub-parts.

Part - B: 1) No 21 to 26 are Very short answer type questions of 2 mark each

2) Question No 27 to 33 are Short Answer Type questions of 3 marks each

3) Question No 34 to 36 are Long Answer Type questions of 5 marks each.

4) Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5 marks.

PART A SECTION 1

Q1) How many prime factors are there in prime factorisation of 5005?

OR

If HCF (a, 8) = 4, LCM (a, 8) = 24, then what is the value of a?

Q2) If $p(x) = x^2 + 5x + 2$, the $p(3) + p(2) + p(0)$ is _____

Q3) The pair of linear equations $2x + 5y = -11$ and $5x + 15y = -44$ _____ solutions.

Q4) 8 chairs and 5 tables for a classroom cost Rs. 10500 while 5 chairs and 3 tables cost Rs. 6450. Form linear equations to represent this situation.

Q5) Which term of the AP 5, 9, 13, 17,...... is 81?

OR

How many terms are there in the AP 7, 11, 15,...., 139?

Q6) Find the roots of the equation $(x+2)(3x-5)=0$.

Q7) Find the nature of the roots of the quadratic equation $4x^2 - 5x + 3 = 0$.

OR

For the quadratic equation $2x^2 - 5x - 3 = 0$, show that $x = 3$ is a solution.

**Q8)** Sides of two similar triangles are in the ratio 4 : 9. Areas of these triangles are in the ratio _____.

Q9) The number of tangents that can be drawn from an external point to a circle is ____.

OR

If a chord AB subtends an angle of 60° at the centre of a circle, then the angle between the tangents to the circle drawn from A and B is _____.

Q10) A man goes 15 m due west and then 8 m due north. How far is he from the starting point?

If D and E are points on the sides AB and AC respectively of triangle ABC such that AB=5.6 cm, AD=1.4 cm, AC =

7.2 cm and AE = 1.8 cm, show that DE‖BC.
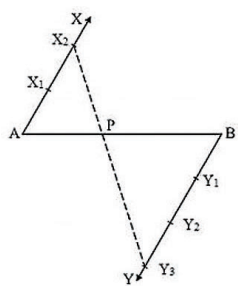
Q11) In what ratio does the point P divide the line segment AB in the given figure?

Q12) Evaluate $\cos 48^\circ - \sin 42^\circ$.

Q13) If $x = 2\sin 2\theta$ and $y = 2\cos 2\theta + 1$, then find $x + y$.

Q14) From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from its centre is 25 cm. The radius of the circle is ____.

Q15) The dimensions of a metallic cuboid are 100 cm X 80 cm X 64 cm. It is melted and recast into a cube. Find the surface area of the cube.

Q16) Find the probability of getting an even prime number when a die is thrown once.

OR

If P(E) = 0.05, what is the probability of 'not E'?

SECTION-II

Case study based questions are compulsory. Attempt any four sub parts of each question. Each subpart carries 1 mark

Q17) Suresh is having a garden near Delhi. In the garden, there are different types of trees and flower plants. One day due to heavy rain and storm one of the trees got broken as shown in the figure. The height of the unbroken part is 15 m and the broken part of the tree has fallen at 20 m away from the base of the tree.

15 m

20 m
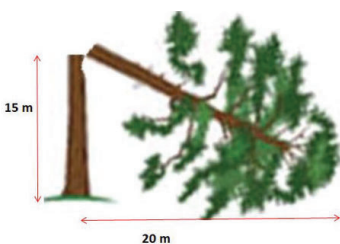
Using the Pythagoras answer the following questions:

1) What is the length of the broken part?
1. 15 m 2. 20 m 3. 25 m 4.30 m

2) What was the height of the full tree?
1. 40 m 2. 50 m 3. 35 m 4. 30 m

3) In the formed right angle triangle what is the length of the hypotenuse?
1. 15 m 2. 20 m 3. 25 m 4. 30m

4) What is the area of the formed right angle triangle?
1. 100 m2 2. 200 m2 3. 60 m2 4. 150 m2

5) What is the perimeter of the formed triangle?
1. 60 m 2. 50 m 3. 45 m 4.100 m

Q18) Mathematics teacher of a school took her 10th standard students to show Red fort. It was a part of their Educational trip. The teacher had

interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical.7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes.

i) How much cloth material will be required to cover 2 big domes each of radius 2.5 metres? (Take π = 22/7)
a) 75m² b) 78.57m²
c) 87.47m² d) 25.8m²

ii) Write the formula to find the volume of a cylindrical pillar.
a) π r2h b) π r l c) π r(l + r) d) 2πr

iii) Find the lateral surface area of two pillars if height of the pillar is 7m and radius of the base is 1.4m.
a) 112.3cm² b) 123.2m²
c) 90m² d) 345.2cm²

iv) How much is the volume of a hemisphere if the radius of the base is 3.5m?
a) 85.9 m³ b) 80 m³
c) 98 m³ d) 89.83 m³

v) What is the ratio of sum of volumes of two hemispheres of radius 1cm each to the volume of a sphere of radius 2 cm?
a) 1:1 b) 1:8 c) 8 :1 d) 1:16

Q19) Due to heavy storm an electric wire got bent as shown in the figure. It followed a mathematical shape. Answer the following questions below.
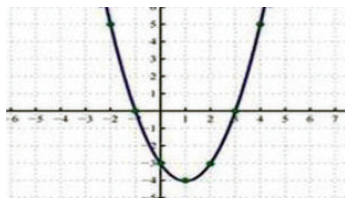
i) Name the shape in which the wire is bent
a) Spiral b) ellipse
c) linear d) Parabola

**ii)** How many zeroes are there for the polynomial (shape of the wire)
a) 2 b) 3 c) 1 d) 0

iii) The zeroes of the polynomial are
a) -1, 5 b) -1, 3 c) 3, 5 d) -4, 2

iv) What will be the expression of the polynomial?
a) $x^2 + 2x - 3$ b) $x^2 - 2x + 3$
c) $x^2 - 2x - 3$ d) $x^2 + 2x + 3$

v) What is the value of the polynomial if x = -1?
a) 6 b) -18 c) 18 d) 0

Q20) Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a triangular grassy lawn in the plot as

shown in the fig. The students are to sow seeds of flowering plants on the remaining area of the plot.
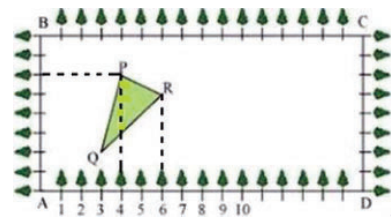
Considering A as origin, answer question (i) to (v)

i) Considering A as the origin, what are the coordinates of A?
a) (0,1) b) (1,0) c) (0,0) d)(-1,-1)

ii) What are the coordinates of P?
a) (4,6) b) (6,4) c) (4,5) d) (5,4)

iii) What are the coordinates of R?
a) (6,5) b) (5,6) c) (6,0) d) (7,4)

iv) What are the coordinates of D?
a) (16,0) b) (0,0) c) (0,16) d) (16,1)

v) What are the coordinate of P if D is taken as the origin?
a) (12,2) b) (-12,6) c) (12,3) d) (6,10)

PART -B

All questions are compulsory. In case of internal choices, attempt any one.

Q21) Given that HCF(306, 657)=9, find LCM (306, 657).

Q22) Find the point on x-axis which is equidistant from the points (2,-2) and (-4,2)

OR

P (-2, 5) and Q (3, 2) are two points. Find the co-ordinates of the point R on PQ such that PR=2QR.

Q23) Find the two numbers whose sum is 27 and product is 182.

Q24) Draw a line segment AB of length 9cm. With A and B as centres, draw circles of radius 5cm and 3cm respectively. Construct tangents to each circle from the centre of the other circle.

Q25) If tan A=cot B, prove that A+B=90o.

OR

Evaluate sin 60° cos 30°+sin 30° cos 60°

Q26) Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

Q27) Prove that 2-√3 is irrational, given that √3 is irrational.

Q28) The sum of the reciprocals of Rehan's ages, 3 years ago and 5 years from now is 1/3. Find his present age.
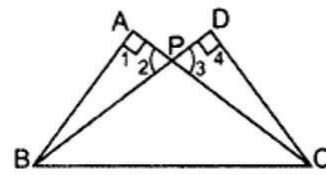
OR

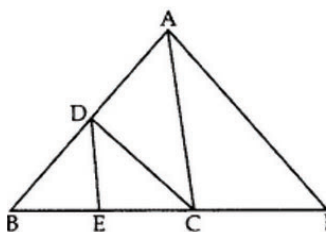Find the root of the quadratic equation

$-x^2 + 7x - 10 = 0$.

Q29) If an isosceles triangle ABC in which AB= AC= 6 cm, is inscribed in a circle of radius 9 cm, find the area of the triangle.

Q30) In the figure ABC and DBC are two right triangles. Prove that AP × PC = BP × PD. (2013)

OR

In the given figure, CD ‖ LA and DE ‖ AC. Find the length of CL if BE = 4 cm and EC = 2 cm. (2012)

Q31) Find the median of the data using an empirical formula, when it is given that mode = 35.3 and mean = 30.5.

Q32) The shadow of a tower standing on level ground is found to be 40 m longer when the Sun's altitude is 30° than when it is 60°. Find the height of the tower.

Q33) If the median of the distribution given below is 28.5, find the values of x and y.

CLASS INTERVAL	FREQUENCY
0-10	5
10-20	X
20-30	20
30-40	15
40-50	Y
50-60	5
TOTAL	60

Q34) The two palm trees are of equal heights and are standing opposite each other on either side of the river, which is 80 m wide. From a point O between them on the river the angles of elevation of the top of the trees are 60° and 30°, respectively. Find the height of the trees and the distances of the point O from the trees.

OR

The angles of depression of the top and bottom of a building 50 meters high as observed from the top of a tower are 30° and 60° respectively. Find the height of the tower, and also the horizontal distance between the building and the tower.

Q35) Water is flowing through a cylindrical pipe of internal diameter 2cm, into a cylindrical tank of base radius 40 cm at the rate of 0.7m/sec. By how much will the water rise in the tank in half an hour?

Q36) A motorboat covers a distance of 16km upstream and 24km downstream in 6 hours. In the same time it covers a distance of 12 km upstream and 36km downstream. Find the speed of the boat in still water and that of the stream.

Learn to add value in economics & score

Attempt any 10 questions from the following

Exams R fun | MODEL PAPER ECONOMICS CLASS XII, TIME: 1hr TOTAL MARKS: 100

Q1) If factor income received from abroad is equal to factor income paid to abroad, then which one of the following is not a valid question:
a) National income = Domestic income
b) NDP at FC + Depreciation = GNP at FC
c) NDP at FC+ Depreciation = GNP at MP
d) All are valid

Q2) Fill in the blanks: NNP at _____

$$\frac{FC}{GDP \text{ at } MP} = $$
a) + Depreciation- NFIA- NIT
b) _____ +Depreciation + NFIA+NIT
c) + Depreciation - NFIA + NIT
d) + Depreciation + NFIA - NIT

Q3) If economic subsidies are added to and indirect taxes are sub-

tracted from national income at market price, then it will be equal to:
a) Domestic income
b) National income
c) Gross National product at market price
d) Gross Domestic product at factor cost

Q4) Which one of the following is not a component of operating surplus:
a) Interest b) Rent
c) Royalty
d) Compensation to Employees

Q5) In which type of economy is Domestic income equal to National income:
a) Open Economy
b) Closed Economy
c) Both a & b
d) Neither a & b

Q6) Domestic factor income is another name of:
a) NDP at FC b) NNP at MP
c) GDP at FC d) NNP at FC

Q7) Net Domestic product at factor cost is less than national income when:
a) NFIA is positive
b) NFIA is negative
c) NFIA is zero
d) Net exports are positive

Q8) National income is equal to:
a) Domestic product plus factor

income earned from abroad
b) Domestic product plus net factor income earned from abroad
c) Domestic product minus factor income to abroad
d) Domestic product plus exports minus imports

Q9) If net national product is given at market price, we _____ indirect taxes and _____ subsidies to get national income of the economy:
a) Add, Subtract
b) Add, Divide
c) Subtract, Add
d) Subtract, Divide

Q10) From the following compute, GNP at MP. GDP at FC=3000,

NFIA=200, Indirect Taxes=420 & subsidies=240:
a) 3380 b) 2980
c) 3020 d) 2620

Q11) If GNP at MP = 58350, IT= 2590,
Subsidies= 1540, Depreciation= 1625 and NFIA = (240), calculate the Domestic income?

Q12) If GDP at MP= 4800, IT = 300, NFIA = 80, Consumption of fixed capital = 200, and Subsidies = 60. Calculate NNP at FC?

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