

E-CAT 2013 collected mcqs

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1) If Thermistor Is Placed In Oven If Temp Of oven Is Increased Then The

a) R Increases b) R Decreases

2 A Body is accelerating downward with 9.8ms^{-2} . If we throw it with some force, then acceleration will be:

a) More than 9.8 b) Less than 9.8 c) Equal d) None

3) $1 + \cos x / \sin x + \sin x / 1 + \cos x$ equal to

a) $2/\sin x$ b) $\tan 2x$

4) To Increase Charging of Capacitor

a) Resistance Decrease b) Capacitance Increases c) Fixed Capacitance

5) The Function $y = 3x - x^2$ for $x \geq 0$ Has A MAX Val AT

a) 1,2 b) 2,1 c) 3,4 d) 2,2

6) When Borax Is Hydrolized Then Caustic Soda And Boric Acid Is Produced Then The Solution Is

a) Neutral b) Acidic c) Alkaline

7) How Many Arrangments Of The Letters Of FASTING Can B Made

1) 5040 b) 2045

8) In Exothermic Reaction If Temp Is Increased Then Reaction Moves

A) Backward Forward C) No Change

9) The Angular Frequency Of A Pendulum Is 1 Rad/sec Its Length Will Be :

1. 24 m 2. 9.8 m 3. 98 m 4. None

Nylon Is Which Type Of Polymer

a) Condensation b) Addition

10) How Many Maximum Amino Groups In Amino Acid?

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

11) The Table Represents

00 0

01 0

10 0

11 1

a) And b) Nand c) OR

12) Lithium and sodium both belongs to same group but Lithium differs in properties remarkably because

A) Lithium is lighter than sodium B) large charge to size ratio C) Li slowly react with water D) ALL

13) If 1 micro coulomb charge is pass through wire in 1 micro second then current will be

a) 1 A b) 1 Micro Ampere c) None

14) $n^2!/(n-1)!(n-2)!$

a) n b) n^2 c) $n^3 - n^2$

15) $\log 9y + \log 3y = 3$

a) 9 b) 27 c) 3

16) Orbital speed of stallites going around the earth increased if the distance from earth is.....

a) increased b) decreased c) Remain same

17) The repeating unit is $(-CH_2-CH_2-)_n$ the molecular mass of repeating unit is

a) 63000 b) 5800

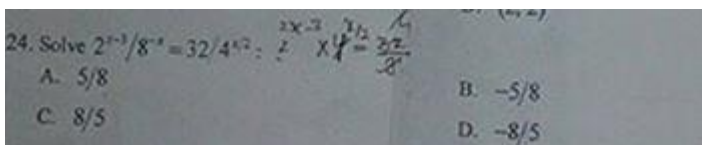
18) a helicopter is ascending vertically at the rate of 19.6 ms^{-1} when it is at a height of 156.8m above the ground. how long the stone takes to reach the ground

a) 8 Sec b) 4 Seconds 1st year 3rd chp 1st numerical

19) Tesla is a unit of magnetic field is equal to?

a) Nm/A b) NmA c) none

20)



21) A coin is tossed. If it lands head a point value of +1 is recorded if it is tails then -1. If the coin is tossed 50 times and the final score is 14 how many heads landed.

a) 14 b) 25 c) 32 d) 39

22) the ph of $10^{-7.5}$ hydrogen is

a) 7.5 b) 6.5

23) 3 Integal 2 $(x^3 + 2x^2 + 1)$ Three Or 2 Ipper or lower limits hain

a) 15 b) 25

24) which has no Hydrogen bonding a) alcohol b) water c) ethane d) acetic acid

25) voltage-current graph of non ohmic device is.....

a) is not straight line b) straight line c) parabola

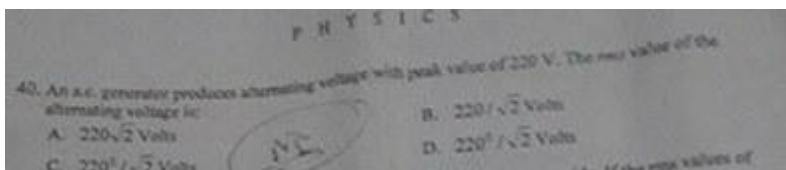
26) ammeter is a galvanometer with a

a) high resistance connected in parallel b) low resistance connected in parallel
c) high resistance connected in series d) low resistance connected in series

27) the coefficient of x in the expansion of $(1 - 2x)^n$ is -8 then the coefficient of x^2 will be

28) which one is not true about hydrocarbons

a) they are aromatic compounds b) they have high C:H ratio c) they are ring compounds d) all have odour



29)

30) hydrocarbon containing triple bond are

A) alkene B) aromatic C) alkane D) none

31) $9x^2 + kx + 36 = (3x + n)^2$ value of $k - n$

32) during the preparation of Na electrolysis of sodium salt CaCl_2 is added to

a) To Increase Temp b) To Decrease Temp

33) If a H of 10 dm^3 has N no. of molecules then a Oxygen of 10 dm^3 has ____ no. of molecules??

a) $16N$ b) $N/16$ c) NA value $(6.02 \cdot 10^{23})$ d) N

34) 100 kg mass 100m radius 36ms⁻¹ speed centripetal force

a) 100N

35) if power of body is 10 Js^{-1} then energy of body is

a) 100J b) 10 J

36) oxidation state of Cl in NaCl and NaOCl is

a) -1, +1 b) 2, -1 c) -1, 2 d) none

37) which of following does not have hexagonal structure

a) Zn b) graphite c) Zn oxide d) gold

38) phenol is a) similar to alcohol b) contains one OH C) it is aromatic contain benzene ring d) it also contain more than 1 OH

39) Find values of p and k

[01]

[10]

if $A + A^{-1} = kI$

2 and 1 b) 1 and 2

40) zn can be converted into cu by

a) neutron b) α particles c) β particles

41) A line $X=Y+2$ intersects at $Y^2=XY-1$...coordinates of points of intersection are:

42) a man is standing at the pole looks at the car 10m away from pole the angle of depression is 45° find the height of pole...

a) 10 m b) 100m

43) 4m where bio gas obtained?

a) is not a gas b) obtained from cattle wastes c) underwater reservoirs

44) Find Solution Of Equations $2x-y-4$

$2x^2-4xy-y^2$

45) $[a \ b \ \gamma \ 1]$

$[b \ \gamma+a \ 1]$

$[\gamma \ a+b \ 1]$ determinant equal to

a) 0 b) 1

46) if $s=[01]$

$[10]$ then s^4

a) Identity Matrice

4. When a metal surface is exposed to light, it may emit electrons. The maximum energy of these electrons depends on:
A. Intensity of light. B. Area of metal surface.
C. Wavelength of light. D. All of the above.

47)

29. The solution of $125^x = 25(5^x)$ and $7^x + 49^x = 1$ is:
A. $(2/5, 4/5)$ B. $(4/5, 2/5)$
C. $(2/5, -4/5)$ D. $(-2/5, 4/5)$

48)

49) $\pi/2 \int_0^1 (\sin y + 2) dy$

a) 0 b) 1 c) $\pi+1$

50) if $x = \sin \theta$ then find $\cos \theta$

a) $+\sqrt{1-x^2}$ b) $-\sqrt{1-x^2}$

51) which one is covalent bonding giant molecule

a) diamond b) sugar c) ice

8. In frequency modulation, the amplitude of the carrier waves remains the same but its frequency changes in proportion to:
A. The amplitude of the modulating signal. B. The frequency of the modulating signal.
C. The sign of the modulating signal. D. All of the above.

52)

27. If $\sqrt{a+b\sqrt{3}} = 13(4+\sqrt{3})^{-1/2}$ then the value of integers a and b are:
 A. -19 and $+8$ B. $+19$ and -8
 C. -19 and -8 D. $+19$ and $+8$

53)

9. In circuit X, $L=5\text{mH}$ and $C=10\text{pF}$ are connected in series. In circuit Y, $L=10\text{mH}$ and $C=5\text{pF}$ are connected in parallel. The resonant frequencies f_x and f_y of circuits X and Y respectively, are related by:
 A. $f_x = 50f_y$ B. $f_x = 0.02f_y$
 C. $f_x = f_y$ D. Cannot be determined.

54)

55) a train travelling a sounds a whistle of frequency 5270hz.frequency of sound heard by the driver was
 a) 5270 b) more than 5270 c) less than 5270

1. A transformer has 50 turns on the input side and 200 turns on the output side. The input voltage and current are 120 V and 3 A. Then the output power is about:
 A. 480 Watts B. 1440 Watts
 C. 360 Watts D. 90 Watts

56)

if the rms values of input voltage... tht was missing

57) $e^{\sin(5-2x)}$ difrentiation

a) $2\cos e^{\sin(5-2x)}$

58) when we tune a radio that means

a) capacitance changes b) inductance changes c)resistance changes d)we change the frequency ic questn ma 4th option k bre ma sure nhi

59) if determinant of matrix is 15 then find values of w

$\begin{bmatrix} w & 2w+5 \end{bmatrix}$

$\begin{bmatrix} -1 & w+1 \end{bmatrix}$

a) 2,-5

60) the directn of induced currnt is always so as to oppose tha chng which causes the crrent

a) Lenz Law b) Farady Law

61) expand upto 2 terms $(2.02)^4$ binomial theorem through

a) 16.44 b)0.644

62) If X Oxidation produdes y product then

a) 2ndry alcohol : ketone b) primary alcohol aldehyde

63) milkiens method is used to determine?

a) e/m of electron b) Charge On Electron c) Mass Of Electron

64) if three resistances r connected in parallel thier eqivqlent resistance is

a) $R/3\text{ohm}$ b) $9R$ c) $3R$

65) What is oxidation state of Sulphur in Na_2SO_4 ?

a) 2 b) 5 c) 4 d) 0

66) If three resistances r connected in series then their equivalent resistance is

3R b) 9R c) $R/9$ d) $3/R$

67) Voltmeter is a device a) high internal resistance b) low internal resistance

Windmills in antiquity

The windwheel of the Greek engineer Heron of Alexandria in the first century AD is the earliest known instance of using a wind-driven wheel to power a machine.^{[14][15]} Another early example of a wind-driven wheel was the *prayer wheel*, which was used in ancient Tibet and China since the fourth century.^[16] It has been claimed that the Babylonian emperor Hammurabi planned to use wind power for his ambitious irrigation project in the 17th century BC.^[17]

This paragraph was asked in English

Horizontal windmills

The first practical windmills had sails that rotated in a horizontal plane, around a vertical axis.^[18] According to Ahmad Y. al-Hassan, these *panemone windmills* were invented in eastern Persia as recorded by the Persian geographer Estakhri in the 9th century.^{[19][10]} The authenticity of an earlier anecdote of a windmill involving the second caliph Umar (AD 634–644) is questioned on the grounds that it appears in a 10th-century document.^[11] Made of six to 12 sails covered in reed matting or cloth material, these windmills were used to grind grain or draw up water, and were quite different from the later European vertical windmills. Windmills were in widespread use across the Middle East and Central Asia, and later spread to China and India from there.^[12]

A similar type of horizontal windmill with rectangular blades, used for irrigation, can also be found in 13th-century China (during the Jurchen Jin Dynasty in the north), introduced by the travels of Yelü Chucai to Turkestan in 1219.^[13]

Horizontal windmills were built, in small numbers, in Europe during the 18th and 19th centuries,^[2] for example Fowler's Mill at Battersea in London, and Hooper's Mill at Margate in Kent. These early modern examples seem not to have been directly influenced by the horizontal windmills of the Middle and Far East, but to have been independent inventions by engineers influenced by the Industrial Revolution.^[14]

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Vertical windmills

Due to a lack of evidence, debate occurs among historians as to whether or not Middle Eastern horizontal windmills triggered the original development of European windmills.^{[15][10][17][16]} In northwestern Europe, the horizontal-axis or vertical windmill (so called due to the plane of the movement of its sails) is believed to date from the last quarter of the 12th century in the triangle of northern France, eastern England and Flanders.

The earliest certain reference to a windmill in Europe (assumed to have been of the vertical type) dates from 1185, in the former village of Weedley in Yorkshire which was located at the southern tip of the Wold overlooking the Humber estuary.^[19] A number of earlier, but less certainly dated, 12th-century European sources referring to windmills have also been found.^[20] These earliest mills were used to grind cereals.

68) From Where this Paragraph Has Been Taken

Wikipedia The Free Encyclopedia

69) CH_2O_2 by combustion analysis find the ratio of carbon to hydrogen in compound

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

70) Free Chlorine Forms In

a) Lithosphere b) Troposphere c) Biosphere d) Stratosphere