

## INSTITUTE OF ENGINEERING

## Model Entrance Exam

## (Set-13)

## Instructions:

There are 100 multiple-choice questions, each having four choices of which only one choice is correct.

## Section-A (1 marks)

1) The number of recommendations made by her $\qquad$ mentioning.
a) are worth
b) have been worth
c) is worth
d) were worth
2) I needed $\qquad$ hard for the exams.
a) working
b) work
c) to working
d) to work
3) While Mother was cooking dinner, I $\qquad$ for my exams.
a) studied
b) study
c) had studied
d) was studying
4) The manager would rather $\qquad$ at his office than stayed at home last week.
a) have worked
b) work
c) had worked
d) working
5) Don't take advantage $\qquad$ the situation.
a) of
b) for
c) at
d) with
6) "To hit below the belt" means $\qquad$ .
a) attack suddenly
b) criticize somebody
c) find a weak spot
d) use unfair means
7) The passive voice of, "Do you imitate others?" is:
a) Are others imitated by you?
b) Are others being imitated by you?
c) Were others being imitated by you?
d) Have others been imitated by you?
8) Auspicious (Antonym):
a) favoring
b) fortunate
c) sinister
d) timely
9) Grotesque (Synonym):
a) graceful
b) eccentric
c) natural
d) realistic
10) Transform the given sentence into complex sentence.
"My ambition is to serve the country."
a) My ambition is that I should serve my country.
b) My ambition is that I shall serve my country.
c) To serve my country is my ambition.
d) I serve my country is my great ambition.
11) The word 'homogeneous' has a stress on its $\qquad$ syllable.
a) second
b) third
c) fourth
d) fifth
12) Which of the following does not have $/ \tau /$ sound?
a) put
b) wood
c) boot
d) could
13) If ABC is an equilateral triangle of side ' $a$ ', then the value of $\overrightarrow{A B} \cdot \overrightarrow{B C}+\overrightarrow{C A} \cdot \overrightarrow{C B}$ is equal to:
a) $\frac{3 a^{2}}{2}$
b) $3 a^{2}$
c) $\frac{-3 a^{2}}{2}$
d) $\frac{3 a^{2}}{4}$
14) The graph of the equation $x^{2}+y^{2}=0$ in three dimensions is:
a) $x$-axis
b) $y$-axis
c) $z$-axis
d) both a and b
15) The ellipse $\frac{x^{2}}{25}+\frac{y^{2}}{16}=1$ and hyperbola $\frac{x^{2}}{25}-\frac{y^{2}}{16}=1$ have in common:
a) centre, foci and directrices
b) centre only
c) centre and vertices only
d) centre, foci and vertices
16) If the line $2 x+y+\lambda=0$ is a normal to the parabola $y^{2}=-8 x$, then $\lambda=$
a) 12
b) -12
c) 24
d) -24
17) The centre of the circle $r^{2}=2-4 r \cos \theta+6 r \sin \theta$ is:
a) $(2,3)$
b) $(-2,3)$
c) $(-2,-3)$
d) $(2,-3)$
18) For specifying a straight line, how many geometrical parameters should be known?
a) 1
b) 2
c) 3
d) 4
19) Let E be the set of all integers with 1 at their unit places. The probability that a number chosen from $\{2,3,4, \ldots, 50\}$ is an element of E , is:
a) $\frac{5}{49}$
b) $\frac{4}{49}$
c) $\frac{3}{49}$
d) $\frac{2}{49}$
20) If $\sin \theta+\cos \theta=\sin 2 \theta+\cos 2 \theta$, then $\theta$ is equal to:
a) $\frac{\pi}{6}$
b) $\frac{\pi}{3}$
c) $\frac{\pi}{4}$
d) $\frac{\pi}{2}$
21) If $\sec ^{-1} x=\operatorname{cosec}^{-1} y$, then the value of $\cos ^{-1} \frac{1}{x}+\cos ^{-1} \frac{1}{y}$ is:
a) $\frac{\pi}{4}$
b) $\frac{\pi}{6}$
c) $\frac{\pi}{2}$
d) $\pi$
22) $\lim _{x \rightarrow 0} \frac{e^{x}-e^{-x}}{\sin x}=$
a) 1
b) -1
c) 3
d) 2
23) A function defined by $f(x)=\frac{|x-2|}{(x-2)}$ is:
a) continuous at $x=2$
b) discontinuous at $x=2$
c) continuous at $x=2$ and discontinuous at $x=-2$
d) continuous on $\mathfrak{R}$
24) If $y=e^{\sqrt{2 x}}$, then $\frac{d y}{d x}=$
a) $\frac{e^{\sqrt{2 x}}}{\sqrt{2 x}}$
b) $e^{2 x}$
c) $\frac{e^{\sqrt{2 x}}}{2}$
d) $\sqrt{2} e^{\sqrt{2 x}}$
25) $\int \frac{1+\cos ^{2} x}{\sin ^{2} x} d x=$
a) $-\cot 2 x-2 x+c$
b) $-2 \cot x-2 x+c$
c) $-2 \cot x-x+c$
d) $-2 \cot x+x+c$
26) $\int_{0}^{a} \frac{d x}{a^{2}+x^{2}}=$
a) $\frac{\pi}{a}$
b) $\frac{\pi}{2 a}$
c) $\frac{\pi}{3 a}$
d) $\frac{\pi}{4 a}$
27) The function $y=x^{3}+3 x^{2}-9 x+2$ has point of inflection at:
a) $x=-2$
b) $x=3$
c) $x=\frac{1}{2}$
d) $x=-1$
28) The least number of subsets of a non-empty set is:
a) 1
b) 4
c) 3
d) 2
29) The range of the function $\mathrm{f}(\mathrm{x})=e^{x}+1$ is:
a) $(1, \infty)$
b) $\mathrm{R}-\{0\}$
c) $(0, \infty)$
d) $(-\infty, \infty)$
30) If $A=\left[\begin{array}{cc}-3 & 4 \\ 2 & -1\end{array}\right]$, then its characteristic roots are:
a) 1,5
b) 6,1
c) $1,-5$
d) $-1,5$
31) If $x+i y=(a-i b)$, then $(x-i y)=$
a) $a-i b$
b) $2(a+i b)$
c) $\frac{1}{a+i b}$
d) $a+i b$
32) $p$ and $q$ are the roots of the equation $x^{2}+p q=(p+1) x$. Then, the value of $q$ is:
a) -1
b) 1
c) 0
d) 2
33) The emitter of a transistor is doped the heaviest because it:
a) acts as a supplier of charge carriers
b) dissipates maximum power
c) has a larger resistance
d) has a small resistance
34) The wavelength of matter wave is independent of:
a) mass
b) velocity
c) momentum
d) charge
35) To observe diffraction, the size of the obstacle:
a) should be $\lambda / 2$, where $\lambda$ is the wavelength
b) should be of the order of wavelength
c) has no relation to wavelength
d) should be much larger than the wavelength
36) Which of the following is associated with refraction of light?
a) working of optical fibre
b) difference between apparent and real depth of a pond
c) mirage on hot summer days
d) brilliance of diamond
37) When an ac voltage of 220 V is applied to the capacitor C , then:
a) the maximum voltage between plates is 220 V .
b) the current is in phase with the applied voltage.
c) the charge on the plate is not in phase with the applied voltage.
d) power delivered to the capacitor per cycle is zero.
38) A conducting loop is placed in a uniform magnetic field with its plane perpendicular to the field. An emf is induced in the loop if it is:
a) rotated about its axis
b) rotated about a diameter
c) not moved
d) given translational motion in the field
39) A test charge is moved from lower potential point to a higher potential point. The potential energy of test charge will:
a) remain the same
b) increase
c) decrease
d) become zero
40) When a string fixed at its both ends vibrate in 1 loop, 2 loops, 3 loops and 4 loops, the frequencies are in the ratio:
a) $1: 1: 1: 1$
b) 1:2:3:4
c) $4: 3: 2: 1$
d) $1: 4: 9: 16$
41) A simple pendulum suspended from the roof of a lift oscillates with frequency $f$ when the lift is at rest. If the lift falls freely under gravity, its frequency of oscillation becomes:
a) zero
b) f
c) 2 f
d) infinite
42) A heat engine has an efficiency $\eta$. Temperatures of source and sink are each decreased by 100 K . The efficiency of the engine:
a) increases
b) decreases
c) remains constant
d) becomes 1
43) If $\alpha, \beta, \gamma$ are coefficients of linear, superficial and volume expansion respectively, then:
a) $\frac{\beta}{\alpha}=\frac{1}{2}$
b) $\frac{\beta}{\gamma}=\frac{2}{3}$
c) $\frac{\gamma}{\alpha}=\frac{3}{2}$
d) $\frac{\beta}{\alpha}=\frac{\gamma}{\beta}$
44) A body is just floating on the surface of liquid. The density of the body is same as that of the liquid. If the body is slightly pushed down, then it will:
a) come back slowly to its earlier position
b) remain submerged where it is left
c) sink in liquid
d) come out vigorously
45) In motion of an object under the gravitational influence of another object, which of the following quantities is not conserved?
a) Angular momentum
b) Mass of an object
c) Total mechanical energy
d) Linear momentum
46) The displacement of a body is given to be proportional to the cube of time elapsed. The magnitude of acceleration of the body is:
a) increasing with time
b) decreasing with time
c) constant but not zero
d) zero
47) When water is cooled to ice, its entropy:
a) increases
b) decreases
c) remains same
d) becomes zero
48) Total number of metal atoms per unit cell in a face-centered cubic lattice is:
a) 14
b) 8
c) 6
d) 4
49) Number of atoms of oxygen present in 10.6 g of $\mathrm{Na}_{2} \mathrm{CO}_{3}$ will be:
a) $6.02 \times 10^{22}$
b) $12.04 \times 10^{22}$
c) $1.806 \times 10^{23}$
d) $31.8 \times 10^{28}$
50) For azimuthal quantum number $l=3$, the maximum number of electrons will be:
a) 2
b) 6
c) 0
d) 14
51) The molecule having smallest bond angle is:
a) $\mathrm{NCl}_{3}$
b) $\mathrm{AsCl}_{3}$
c) $\mathrm{SbCl}_{3}$
d) $\mathrm{PCl}_{3}$
52) Hydrogen can be prepared by the action of dil. $\mathrm{H}_{2} \mathrm{SO}_{4}$ on:
a) Cu
b) Pb
c) Fe
d) Hg
53) The metallurgical process in which a metal is obtained in a fused state is called:
a) smelting
b) roasting
c) calcination
d) froth floatation
54) The products formed when an aqueous solution of NaBr is electrolyzed in a cell having inert electrodes are:
a) Na and $\mathrm{Br}_{2}$
b) Na and $\mathrm{O}_{2}$
c) $\mathrm{H}_{2}, \mathrm{Br}_{2}$ and NaOH
d) $\mathrm{H}_{2}$ and $\mathrm{O}_{2}$
55) Thermodynamically, the most stable form of carbon is:
a) diamond
b) graphite
c) fullerenes
d) coal
56) Passivity of iron is due to the formation of:
a) $\mathrm{Fe}_{2} \mathrm{O}_{3}$
b) $\mathrm{Fe}_{3} \mathrm{O}_{4}$
c) $\mathrm{FeSO}_{4}$
d) $\mathrm{Fe}(\mathrm{OH})_{3}$
57) In Lassaigne's test, red colour precipitate is obtained which is due to the formation of:
a) FeCNS
b) $\mathrm{Fe}(\mathrm{CNS})_{2}$
c) NaCNS
d) $\mathrm{Fe}(\mathrm{CNS})_{3}$
58) Dehydration of alcohol is an example of which type of reaction?
a) substitution
b) Elimination
c) Addition
d) Rearrangement
59) Which of the following does not form sodium bisulphite addition product with sodium bisulphite solution?
a) HCHO
b) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{COCH}_{3}$
c) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CHO}$
d) $\mathrm{CH}_{3} \mathrm{CHO}$
60) Which one of the following is the most basic in nature?
a) $\mathrm{NH}_{3}$
b) $\mathrm{CH}_{3} \mathrm{NH}_{2}$
c) $\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NH}$
d) $\left(\mathrm{CH}_{3}\right)_{3} \mathrm{~N}$

## Section-B (2 marks)

Read the following passages and answer the questions given below (61-64):
Theodore Roosevelt was born with asthma and poor eyesight, yet this sickly child later won fame as a political leader, a Rough Rider, and a hero of the common people. To conquer his handicaps, Teddy trained in a gym and became a lightweight boxer at Harvard. Out west, he hunted buffalo and ran a cattle ranch. Back east, he became a civil service reformer and police commissioner. He became President McKinley's assistant Navy secretary during the Spanish-American War. Also, he led a charge of cavalry Rough Riders up San Juan Hill in Cuba. After achieving fame, he became governor of New York and went on to become the vice president.

When McKinley was assassinated, Theodore Roosevelt became the youngest president at age 42. He is famous for his motto, "Speak softly and carry a big stick." Roosevelt battled for meat inspection and purefood laws. Also, he wanted to save the forests and break the grip that big business had on steel and oil. Roosevelt persuaded the diplomats of warring Russia and Japan to make peace.
61) Which of the following states the main idea of the passage?
a) Theodore Roosevelt was a man of many accomplishments.
b) Presidents should speak softly and carry big sticks.
c) Presidents can help countries make peace.
d) A governor can become a president.
62) What achievement illustrates Roosevelt's ability to overcome personal obstacles?
a) He led a charge of cavalry Rough Riders in Cuba.
b) He is famous for his motto, "Speak softly and carry a big stick."
c) He overcame his asthma by training in a gym, and he became a boxer.
d) He became governor of New York.
63) According to the passage, how did Roosevelt first become president?
a) He won the support of his party in a political campaign.
b) As vice president, he took over the presidency when McKinley was assassinated.
c) He won the nation's popular vote.
d) He won the necessary Electoral College votes.
64) He first worked under President McKinley in what capacity?
a) assistant Navy secretary during the Spanish-American War
b) police commissioner
c) governor of New York
d) civil service reformer
65) The equation $x-y=4$ and $x^{2}+4 y x+y^{2}=0$ represents the side of:
a) an equilateral triangle
b) a right-angled triangle
c) an isosceles triangle
d) a scalene triangle
66) If $y=m x$ lies outside the circle $x^{2}+y^{2}-20 y+90=0$, then:
a) $|m|>3$
b) $|m|<3$
c) $m>3$
d) $m<3$
67) The area of a triangle formed by joining the vertex and the end points of latus rectum of $x^{2}=12 y$ is:
a) 12
b) 18
c) 24
d) 36
68) If length of perpendicular from origin on a plane be 7 and it dr's be $-3,2,6$, then it's equation will be:
a) $3 x-2 y+6 z+7=0$
b) $-3 x+2 y-6 z-49=0$
c) $-3 x+2 y+6 z-7=0$
d) $-3 x+2 y+6 z-49=0$
69) The vector $\vec{a}$ lies in the plane of $\vec{b}$ and $\vec{c}$, then which of the following is correct?
a) $\vec{a} \cdot \vec{b} \times \vec{c}=-1$
b) $\vec{a} . \vec{b} \times \vec{c}=1$
c) $\vec{a} .(\vec{b} \times \vec{c})=0$
d) $\vec{a} . \vec{b} \times \vec{c}=3$
70) The mean of 50 observations is 36 . If two observations 30 and 42 are to be excluded, then the mean of the remaining observations will be:
a) 36
b) 38
c) 48
d) 50
71) In a triangle $\mathrm{ABC}, \angle C=\frac{\pi}{2}$. If its inradius and circumradius be r and R respectively, then $2(r+R)$ is equal to:
a) $a+b$
b) $b+c$
c) $c+a$
d) $a+b+c$
72) The coefficient of $r^{t h}$ and $(r+1)^{t h}$ term in the expansion of $(1+x)^{20}$ are in the ratio $1: 2$, then $r=$
a) 6
b) 8
c) 9
d) 7
73) If $T_{n}=\frac{3^{n}}{2(n!)}-\frac{1}{2(n!)}$, then $S_{\infty}=$
a) $\frac{e^{3}-1}{2}$
b) $\frac{e^{3}-e}{2}$
c) $\frac{e-3}{2}$
d) $\frac{e^{2}-3}{2}$
74) A committee of 5 is to be formed out of 6 gentlemen and 4 ladies. In how many ways this can be done if at least 2 ladies are included?
a) 186
b) 200
c) 316
d) 420
75) For $f(x)=x^{2}$ and $g(x)=2^{x}$, the solution set of $\operatorname{fog}(x)=\operatorname{gof}(x)$ is:
a) $R$
b) $Z^{+}$
c) $\{0\}$
d) $\{0,2\}$
76) Sum of $3+3 \alpha+3 \alpha^{2}+\cdots+\infty$ is equal to $\frac{45}{8},(\alpha>0)$, then $\alpha=$
a) $\frac{3}{16}$
b) $\frac{1}{4}$
c) $\frac{7}{15}$
d) $\frac{5}{8}$
77) $\lim _{x \rightarrow 0}\left(\frac{1+2 x}{1-3 x}\right)^{\frac{1}{x}}=$
a) $e^{2}$
b) $e^{3}$
c) $e^{4}$
d) $e^{5}$
78) If $x=a(t+\sin t)$ and $y=a(1-\cos t)$, then $\frac{d y}{d x}=$
a) $\cot t$
b) $2 \sin t \cos t$
c) $\tan \frac{t}{2}$
d) $-\tan t$
79) The area between the curves $x^{2}=4 b y$ and the ordinate at the point $(\mathrm{b}, 0)$ is:
a) $4 b^{2}$
b) $\frac{b^{2}}{12}$
c) $\frac{4 b^{2}}{3}$
d) $\frac{2 b^{2}}{3}$
80) The integrating factor of the differential equation $\frac{d y}{d x}(x \log x)+y=2 \log x$ is:
a) $\log x$
b) $e^{x}$
c) $\log (\log x)$
d) $x$
81) At a given instant, there are $25 \%$ undecayed radioactive nuclei in a sample. After 10 seconds, the number of undecayed nuclei reduces to $12.5 \%$, then the mean life of the nuclei is:
a) 10.21 s
b) 14.43 s
c) 5.31 s
d) 7.43 s
82) The wavelength of radiation emitted is $\lambda_{0}$ when an electron jumps from the third to second orbit of hydrogen atom. For the electron jumping from the fourth to the second orbit of the hydrogen atom, the wavelength of radiation emitted will be:
a) $(16 / 25) \lambda_{0}$
b) $(20 / 27) \lambda_{0}$
c) $(27 / 20) \lambda_{0}$
d) $(25 / 16) \lambda_{0}$
83) When the angle of incidence is $60^{\circ}$ on the surface of a glass slab, it is found that the reflected ray is completely polarized. The velocity of light in glass is:
a) $\sqrt{2} \times 10^{8} \mathrm{~m} / \mathrm{s}$
b) $\sqrt{3} \times 10^{8} \mathrm{~m} / \mathrm{s}$
c) $2 \times 10^{8} \mathrm{~m} / \mathrm{s}$
d) $3 \times 10^{8} \mathrm{~m} / \mathrm{s}$
84) A monochromatic light is incident at a certain angle on an equilateral triangular prism and suffers minimum deviation. If the refractive index of the material of the prism is $\sqrt{3}$, then the angle of incidence is:
a) $60^{\circ}$
b) $45^{\circ}$
c) $90^{\circ}$
d) $30^{\circ}$
85) A circular coil of 25 turns and radius of 12 cm is placed in a uniform magnetic field of 0.5 T normal to the plane of coil. If the current in the coil is 5 A , then the total torque experienced by the coil is:
a) 1.5 Nm
b) 2.5 Nm
c) 3.5 Nm
d) zero
86) The battery of a trunk has an emf of 24 V . If the internal resistance of the battery is $0.8 \Omega$, the maximum current that can be drawn from the battery is:
a) 30 A
b) 32 A
c) 33 A
d) 34 A
87) Consider a thin spherical shell of radius R consisting of uniform surface charge density $\sigma$. The electric field at a point outside the shell at a distance x from its centre is:
a) inversely proportional to $\sigma$
b) directly proportional to $x^{2}$
c) directly proportional to $R$
d) inversely proportional to $x^{2}$
88) A train standing at the outer signal of a railway station blows a whistle of frequency 400 Hz in still air. The train begins to move with a speed of $30 \mathrm{~m} / \mathrm{s}$ towards the platform. The frequency of the sound heard by an observer standing on the platform is (speed of sound in air $=330 \mathrm{~m} / \mathrm{s}$ ):
a) 420 Hz
b) 430 Hz
c) 440 Hz
d) 450 Hz
89) The temperature of ' $n$ ' moles of an ideal gas is increased from $T$ to 4 T through a process for which pressure $P=a T^{-1}$, where ' $a$ ' is a constant. Then, the work done by the gas is:
a) $n R T$
b) $4 n R T$
c) $2 n R T$
d) $6 n R T$
90) A steel wire can support a maximum load of W before reaching its elastic limit. How much load another wire, made out of identical steel, but with a radius one half the radius of the first wire, support before reaching its elastic limit?
a) W
b) W/2
c) $W / 4$
d) 4 W
91) When a solid sphere rolls without slipping down an inclined plane making an angle $\theta$ with the horizontal, the acceleration at its centre of mass is $a$. If the same sphere slides without friction, its acceleration $a^{\prime}$ will be:
a) $\frac{7}{2} a$
b) $\frac{5}{7} a$
c) $\frac{7}{5} a$
d) $\frac{5}{2} a$
92) A shell is fired from a fixed artillery gun with an initial speed $u$ such that it hits the target on the ground at a distance R from it. If $t_{1}$ and $t_{2}$ are the values of the time taken by it to hit the target in two possible ways, the product $t_{1} t_{2}$ is:
a) $\mathrm{R} / \mathrm{g}$
b) $\mathrm{R} / 4 \mathrm{~g}$
c) $R / 2 \mathrm{~g}$
d) $2 R / g$
93) 1.0 g of Magnesium is burnt with $0.56 \mathrm{~g} \mathrm{O}_{2}$ in a closed vessel. Which reactant is left in excess and how much?
a) $\mathrm{Mg}, 0.16 \mathrm{~g}$
b) $\mathrm{O}_{2}, 0.16 \mathrm{~g}$
c) $\mathrm{Mg}, 0.44 \mathrm{~g}$
d) $\mathrm{O}_{2}, 0.28 \mathrm{~g}$
94) When $\mathrm{KMnO}_{4}$ reacts with KBr in alkaline medium, bromate ion is formed. The oxidation state of Mn changes from +7 to:
a) +6
b) +4
c) +3
d) +2
95) For the reaction equilibrium, $\mathrm{N}_{2} \mathrm{O}_{4}(\mathrm{~g}) \rightleftharpoons 2 \mathrm{NO}_{2}$, the concentration of $\mathrm{N}_{2} \mathrm{O}_{4}$ and $\mathrm{NO}_{2}$ at equilibrium are $4.8 \times 10^{-2}$ and $1.2 \times 10^{-2} \mathrm{~mol} \mathrm{~L}^{-1}$ respectively. The value of $K_{c}$ for the reaction is:
a) $3.3 \times 10^{2} \mathrm{~mol} \mathrm{~L}^{-1}$
b) $3 \times 10^{-3} \mathrm{~mol} \mathrm{~L}^{-1}$
c) $3 \times 10^{-2} \mathrm{~mol} \mathrm{~L}^{-1}$
d) $3 \times 10^{3} \mathrm{~mol} \mathrm{~L}^{-1}$
96) What current is to be passed for 0.25 sec for the deposition of certain weight of metal which is equal to its electrochemical equivalent?
a) 4 A
b) 100 A
c) 200 A
d) 2 A
97) A metal X on heating in nitrogen gas gives Y . Y on treatment with water gives a colourless gas which when passed through $\mathrm{CuSO}_{4}$ solution gives a blue colour. Y is:
a) $\mathrm{Mg}\left(\mathrm{NO}_{3}\right)_{2}$
b) $\mathrm{Mg}_{3} \mathrm{~N}_{2}$
c) $\mathrm{NH}_{3}$
d) MgO
98) When conc. $\mathrm{H}_{2} \mathrm{SO}_{4}$ is heated with $\mathrm{P}_{2} \mathrm{O}_{5}$, the acid is converted into:
a) sulphur trioxide
b) a mixture of sulphur dioxide and sulphur trioxide
c) sulphur
d) sulphur dioxide
99) The IUPAC name of the following compound is:

a) 1-fluoro-4-methyl-2-nitrobenzene
b) 4-fluoro-1-methyl-3-nitrobenzene
c) 4-methyl-1-fluoro-2-nitrobenzene
d) 2-fluoro-5-methyl-1-nitrobenzene
100) In the following sequence of reactions, $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{OH} \xrightarrow{\mathrm{P}+\mathrm{I}_{2}} \mathrm{~A} \xrightarrow{\text { Mg, ether }} \mathrm{B} \xrightarrow{\mathrm{HCHO}} \mathrm{C} \xrightarrow{\mathrm{H}_{2} \mathrm{O}} \mathrm{D}$, the compound D is:
a) propanal
b) butanal
c) n-butyl alcohol
d) n-propyl alcohol

