

ANALYSIS OF CUT OFF FOR CSIR NET EXAMINATION**Cut Off for Junior Research Fellowships (JRF)**

YEAR	UR (%)	EWS (%)	OBC (%)	SC (%)	ST (%)	PwD (%)
DEC-23	99.21	97.17	97.17	92.24	85.41	72.01
JUN-23	98.99	97.07	96.47	91.98	86.13	75.85
SEP-22	98.81	96.56	96.12	90.96	84.23	61.81
FEB-22	98.79	96.07	96.23	90.53	84.87	64.77
NOV-20	98.94	96.57	96.04	89.68	83.1	74.75
DEC-19	54.5	46.75	45.25	38.25	33.25	25.00
JUN-19	52.5	33.75	43.75	35.25	31.75	25.00
DEC-18	59.25	-	50.5	42.75	37.75	26.00
JUN-18	55.25	-	46.75	40.25	34.00	25.00

Cut Off for Lectureship (LS)

YEAR	UR (%)	EWS (%)	OBC (%)	SC (%)	ST (%)	PwD (%)
DEC-23	98.05	94.05	94.92	88.55	80.55	72.01
JUN-23	97.39	94.81	93.78	88.18	81.35	75.85
SEP-22	97.51	94.03	92.71	86.79	78.6	61.81
FEB-22	97.01	93.88	93.88	88.39	79.83	63.69
NOV-20	97.18	94.00	93.21	85.38	77.51	74.75
DEC-19	49.05	42.08	40.73	34.43	29.93	25.00
JUN-19	47.25	33.00	39.38	31.73	28.58	25.00
DEC-18	53.33	-	45.45	38.48	33.98	25.00
JUN-18	49.73	-	42.08	36.23	30.6	25.00

Note: Cut off from Nov 2020 exam onwards is in percentile score, while for rest of exam it is percentage score.

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RANK BOOSTER

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MOCK TEST

PART - A

1. The houses of three sisters lie in the same row, but the middle sister does not live in the middle house. In the morning, the shadow of the eldest sister's house falls on the youngest sister's house. What can be concluded for sure?

- (1) The youngest sister lives in the middle.
- (2) The eldest sister lives in the middle.
- (3) Either the youngest or the eldest sister lives in the middle.
- (4) The youngest sister's house lies on the east of the middle sister's house.

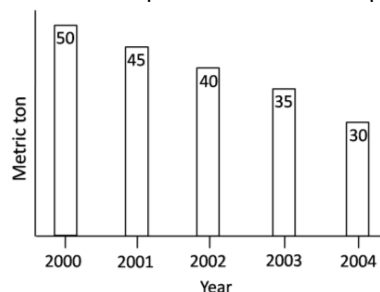
2. A woman starts shopping with Rs. X and Y paise, spends Rs. 3.50 and is left with Rs. 2Y and 2X paise. The amount she started with is

- (1) Rs. 48.24
- (2) Rs. 28.64
- (3) Rs. 32.14
- (4) Rs. 23.42

3. A mine supplies 10000 tons of copper ore, containing an average of 1.5 wt% copper, to a smelter every day. The smelter extracts 80% of the copper from the ore on the same day. What is the production of copper in tons/day?

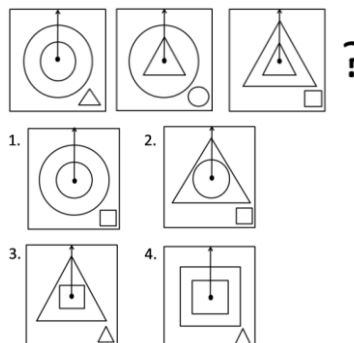
- (1) 80
- (2) 12
- (3) 120
- (4) 150

4. Wheat production of a country over a number of years is shown. Which year recorded highest percent reduction in production over the previous year?



- (1) 2001
- (2) 2002
- (3) 2003
- (4) 2004

5. What is the next pattern in the given sequence?



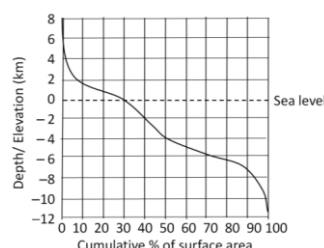
6. A person completely under sea water tracks the Sun. Compared to an observer above water, which of the following observations would be made by the underwater observer?

- (1) Neither the time of sunrise or sunset nor the angular span of the horizon changes.
- (2) Sunrise is delayed, sunset is advanced, but there is no change in the angular span of the horizon.
- (3) Sunrise and sunset times remain unchanged, but the angular span of the horizon shrinks.
- (4) The duration of the day and the angular span of the horizon, both decrease.

7. A man sells three articles A, B, C and gains 10% on A, 20% on B and loses 10% on C. He breaks even when combined selling prices of A and C are considered, whereas he gains 5% when combined selling prices of B and C are considered. What is his net loss or gain on the sale of all the articles?

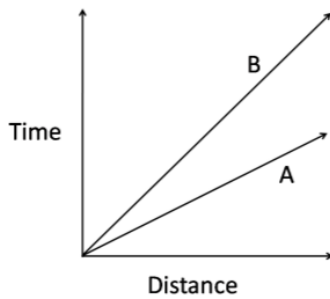
- (1) 10% gain
- (2) 20% gain
- (3) 10.66% gain
- (4) 6.66% gain

8. Based on the distribution of surface area of the Earth at different elevations and depths (with reference to sea-level) shown in the figure, which of the following is FALSE?

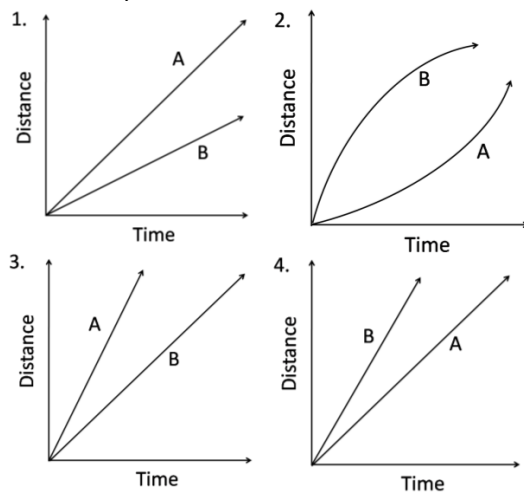


- (1) Larger proportion of the surface of the Earth is below sea-level
- (2) Of the surface area above sea-level, larger proportion lies below 2 km elevation
- (3) Of the surface area below sea-level, smaller proportion lies below 4 km depth
- (4) Distance from sea level to the maximum depth is greater than that to the maximum elevation

9. Time-distance graph of two objects A and B are shown.



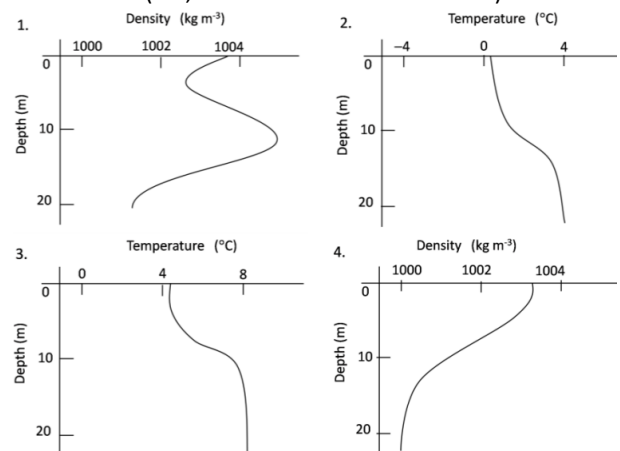
If the axes are interchanged, then the same information is shown by



10. A chocolate salesman is travelling with 3 boxes with 30 chocolates in each box. During his journey he encounters 30 toll booths. Each toll booth inspector takes one chocolate per box that contains chocolate(s), as tax. What is the largest number of chocolates he can be left with after passing through all toll booths?
 - (1) 0
 - (2) 30
 - (3) 25
 - (4) 20
11. A milkman adds 10 litres of water to 90 litres of milk. After selling $\frac{1}{5}$ th of the total quantity, he adds water equal to the quantity he has sold. The proportion of water to milk he sells now would be
 - (1) 72:28
 - (2) 28:72
 - (3) 20:80
 - (4) 30:70

12. Two coconuts have spherical space inside their kernels, with the first having an inner diameter twice that of the other. The larger one is half filled with liquid, while the smaller is completely filled. Which of the following statements is correct?
 - (1) The larger coconut contains 4 times the liquid in the smaller one.
 - (2) The larger coconut contains twice the liquid in the smaller one.
 - (3) The coconuts contain equal volumes of liquid.
 - (4) The smaller coconut contains twice the liquid in the larger one.

13. Which of the following graphs represents a stable fresh water lake? (i.e., no vertical motion of water)



14. A tiger usually stalks its prey from a direction that is upwind of the prey. The reason for this is
 - (1) the wind aids its final burst for killing the prey
 - (2) the wind carries the scent of the prey to the tiger and helps the tiger locate the prey easily
 - (3) the upwind area usually has denser vegetation and better camouflage
 - (4) the upwind location aids the tiger by not letting its smell reach the prey
15. A cellphone tower radiates 1W power while the handset transmitter radiates 0.1 mW power. The correct comparison of the radiation energy received by your head from a tower 100m away (E_1) and that from a handset held to your ear (E_2) is
 - (1) $E_1 \gg E_2$
 - (2) $E_2 \gg E_1$
 - (3) $E_1 = E_2$ for communication to be established
 - (4) insufficient data even for a rough comparison

16. The pitch of a spring is 5 mm. The diameter of the spring is 1 cm. The spring spins about its axis with a speed of 2 rotations/s. The spring appears to be moving parallel to its axis with a speed of

- (1) 1 mm/s (2) 5 mm/s
(3) 6 mm/s (4) 10 mm/s

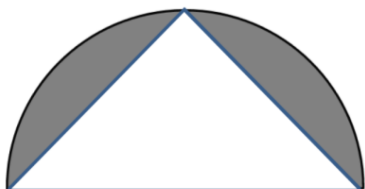
17. The dimensions of a floor are 18 x 24. What is the smallest number of identical square tiles that will pave the entire floor without the need to break any tile?

- (1) 6 (2) 24
(3) 8 (4) 12

18. To determine the number of parrots in a sparse population, an ecologist captures 30 parrots and puts rings around their necks and releases them. After a week he captures 40 parrots and finds that 8 of them have rings on their necks. What approximately is the parrot population?

- (1) 70 (2) 150
(3) 160 (4) 100

19. The mid-point of the arc of a semicircle is connected by two straight lines to the ends of the diameter as shown. What is the ratio of the shaded area to the area of the triangle?



- (1) $(\pi/2) - 1$ (2) $(\pi - 1)/2$
(3) $\pi - 1/2$ (4) $2\pi - \frac{1}{4}$

20. Why is there low fish population in lakes that have large hyacinth growth?

- (1) Hyacinth prevents sunlight from reaching the depths of the lake.
(2) Decaying matter from hyacinth consumes dissolved oxygen in copious amounts.
(3) Hyacinth is not a suitable food for fishes.
(4) Hyacinth releases toxins in the water.

PART- B

21. Calculate the ratio of concentrations of acetate and acetic acid required in a buffer of pH 5.76? (pKa of acetic acid is 4.76)

- (1) 1 (2) 10
(3) 1/10 (4) 100

22. In the presence of a fixed concentration of a competitive inhibitor, which of the following would best characterize an enzyme-catalyzed reaction when the concentration of the substrate is increased?

- (1) The inhibition does not change
(2) The inhibition decreases
(3) The K_m increases
(4) The V_{max} increases

23. Two nitrogen atoms are eliminated per urea cycle. One of these comes from ammonium ion via carbamoyl phosphate. Which of the following compounds brings in the other nitrogen atom?

- (1) Arginine
(2) Citrulline
(3) Aspartate
(4) Ornithine

24. Which statement best describes the pKa of amino groups in proteins?

- (1) pKa of α -amino group is higher than the pKa of ϵ -amino group.
(2) pKa of α -amino group is lower than the pKa of ϵ -amino group.
(3) pKa of α -amino group is same as the pKa of ϵ -amino group.
(4) pKa of α -amino group is higher than the pKa of guanidine side chain of arginine.

25. Microtubules break much more easily than do intermediate filaments, because

- (1) microtubule subunits are smaller than the intermediate filament subunits
(2) microtubule subunits are held by longitudinal bonds while intermediate filaments assemble by forming strong lateral contacts
(3) microtubules are pulled apart by chromosomes
(4) intermediate filaments do not have subunits

26. A culture medium was inoculated with 4.0×10^6 cells of *E. coli* and incubated at 37° C. After 5 hours, there were 8.0×10^9 cells. Assuming that all the growth was exponential and no lag phase existed; the growth rate of the cells (or rate constant for the process) would be

- (1) 0.025 min^{-1}
(2) 0.011 min^{-1}
(3) 0.051 min^{-1}
(4) 0.076 min^{-1}

27. Autophagy is a process in which dysfunctional organelles and cellular components that accumulate during growth and differentiation are degraded via the lysosome and recycled. Cells undergoing autophagy can be identified by visualizing fluorescently labeled
- (1) LAMP1 (2) LC3 puncta
(3) Phosphatidyl serine (4) Apaf-1
28. Which of the following is NOT true for retrotransposons?
- (1) Retrotransposons move by a copy and paste mechanism through an RNA intermediate.
(2) Retrotransposons have introns in the expressed DNA sequence
(3) Retrotransposons are present mainly in eukaryotic system
(4) Retrotransposons are responsible for major increase in genome size during evolution among animals
29. Histone H3-Lys 14 acetylation is generally expected to lead to
- (1) histone assembly on the promoter and recruitment of mediators
(2) activation of a DNA damage checkpoint and DNA repair
(3) gene silencing by hiding promoter of constitutive genes
(4) gene imprinting and inheritance to next generation
30. During protein synthesis in *E. coli* the initiating methionine (AUG) and the internal methionine (AUG) codons of a given mRNA are distinguished by
- (1) fmet-tRNA_f and met-tRNA_m respectively
(2) fmet-tRNA_f, IF-2 versus met-tRNA_m-EF-Tu respectively
(3) fmet-tRNA_f + 30 S ribosomal subunit versus met-tRNA_m + 50 S ribosomal subunit respectively
(4) fmet-tRNA_f, IF-2 versus fmet-tRNA_f-EF-Tu respectively
31. Some errors occur during DNA replication that are not corrected by proof reading activity of DNA polymerase. These are corrected by specialized mismatch repair pathways. Which of the following proteins are involved in mis-match repair mechanism?
- (1) AP endonuclease and DNA glycosidase
(2) MutS and Mut L
(3) Rec-A and Rec-F
(4) XP-A and XP-G
32. In type I self-splicing
- (1) a 'G-OH' from exogenous GMP makes a nucleophilic attack on 5'-P of first base of intron,
(2) a free 2'-OH of an internal adenosine makes a nucleophilic attack on 5'-P of first base of intron
(3) A 3'-OH of an internal adenosine makes a nucleophilic attack on 5'-P of first base of intron
(4) the hydrolysis of last base of exon is carried out by U2/U4/U6
33. Which of the following mechanisms is used by the viral movement proteins to facilitate virus movement within plants?
- (1) Rupturing cell wall
(2) Increasing size exclusion limit of plasmodesmata
(3) Rupturing plasmodesmata by exerting mechanical force
(4) Degrading cell wall using secretory enzymes
34. Which of the following transcription factors play a major role in inflammatory signalling in cells of the vertebrate immune system?
- (1) STAT (2) NF-KB
(3) CREB (4) SP-1
35. If a mouse is repeatedly immunized with a complex protein such as bovine serum albumin (BSA), the resulting serum antibodies will be of
- (1) identical isotype and identical antigen binding sites
(2) various isotypes but identical antigen binding sites
(3) identical isotype but various antigen binding sites
(4) various isotypes and various antigen binding sites
36. Pathogen capable of continually undergoing maturational changes in transformation to two different forms which allow the organism to change its surface molecules is
- (1) *Leishmania donovani* (2) *Trypanosoma brucei*
(3) *Plasmodium falciparum* (4) *Toxoplasma gondii*
37. Which of the following proteins is produced by anchor cell during the vulval development of *C. elegans*?
- (1) Lin 3 (2) Let 23
(3) Par 2 (4) Lin 12
38. Tissue boundaries are largely determined by
- (1) Notch signaling (2) TGF- β signaling
(3) Hedgehog signaling (4) Wingless signaling